

## **G-2.7. Heating & Refrigeration Building**



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Great Lakes Region  
Illinois, Indiana, Michigan,  
Minnesota, North Dakota,  
Ohio, South Dakota,  
Wisconsin

Chicago Airports District Office  
2300 East Devon Avenue  
Des Plaines, Illinois 60018

November 4, 2019

Mr. Anthony Rubano  
Acting Cultural Resources Coordinator  
State Historic Preservation Office  
IDNR – One Natural Resources Way  
Springfield, IL 62702-1271

Mr. Rubano:

Enclosed you will find a copy of a document entitled, *Determination of Eligibility: Heating & Refrigeration Plant Complex, Chicago O'Hare International Airport*. We request that you review the Federal Aviation Administration document to determine if you concur that the Heating & Refrigeration Plant Complex is not eligible for listing on the National Register of Historic Places.

If you have any questions, please feel free to call me at (847) 294-7354.

Sincerely,

A handwritten signature in black ink that reads "Amy B. Hanson". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration

Cc: Aaron Frame, City of Chicago Department of Aviation  
Jamie Rhee, City of Chicago Department of Aviation



## Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271  
www.dnr.illinois.gov

Mailing Address: 1 Old State Capitol Plaza, Springfield, IL 62701

JB Pritzker, Governor  
Colleen Callahan, Director

FAX (217) 524-7525

Cook County  
Chicago

National Register Eligibility, Heating & Refrigeration Plant Complex at O'Hare International Airport  
10000 W. O'Hare Ave.  
SHPO Log #013120219

December 18, 2019

Amy Hanson  
U.S. Department of Transportation  
Federal Aviation Administration  
Chicago Airports District Office  
2300 E. Devon Ave., Suite 201  
Des Plaines, IL 60018

Dear Ms. Hanson:

We have reviewed the information you have provided concerning the referenced project.

We concur with your finding that these structures lack sufficient significance for listing on the National Register of Historic Places.

This letter does not constitute a State Historic Preservation "Sign-off" on the project for the purposes of Section 106 of the National Historic Preservation Act of 1966, as amended.

If you have any further questions, please call 217/782-4836.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert F. Appleman".

Robert F. Appleman  
Deputy State Historic  
Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation  
Jamie Rhee, Commissioner, Chicago Department of Aviation

# **Determination of Eligibility: Heating & Refrigeration Plant Complex**

**Chicago O'Hare International  
Airport**

Prepared for the  
**Federal Aviation Administration**

Prepared by

**Mead  
& Hunt**  
[www.meadhunt.com](http://www.meadhunt.com)

November 2019



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**Executive Summary****Executive Summary**

The historical evaluation of the Heating & Refrigeration (H&R) Plant complex at O'Hare International Airport (O'Hare, or "the airport") supports Federal Aviation Administration (FAA) requirements for compliance with the National Environmental Policy Act (NEPA) and Section 106 regulations issued pursuant to the National Historic Preservation Act (NHPA), as amended (36 CFR Part 800). As part of its review of the City of Chicago's proposed Airport Layout Plan (ALP) modification, FAA is conducting a NEPA process for the proposed Terminal Area Plan (TAP) and other ALP modifications. In April 2019 FAA engaged Mead & Hunt, Inc. (Mead & Hunt), through a third-party contract, to complete a National Register of Historic Places (National Register) evaluation of the H&R Plant.

The H&R Plant is a multi-building complex located at the northeast corner of O'Hare's Terminal Core Area, east of the airport's main parking lots and I-190 (Kennedy Expressway). The plant houses the central heating and cooling systems serving much of the airport. The complex consists of the main H&R Building (constructed in 1962 with major expansions in 1974 and 1987), situated parallel to the terminal arrival/departure access road; the south, north, and east water cooling towers (constructed in 1994, 2007, and 2014 respectively), east of the main building; and two substations (constructed in 1984 and 1987), east of the cooling towers.

The H&R Plant, including the main H&R Building, three cooling towers, and two substations, was evaluated for National Register eligibility under *Criterion A: History*, *Criterion B: Significant Person(s)*, *Criterion C: Architecture*, or *Criterion D: Information Potential*. The H&R Plant possesses significance under National Register *Criterion C* in the areas of *Engineering* and *Architecture*; however, it does not retain sufficient integrity with relation to design, materials, workmanship, feeling, or setting to convey significance under either criterion during its period of significance of 1962. Therefore, the H&R Plant is recommended not eligible for listing in the National Register.

## Executive Summary

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## Section 1 Description

### 1. Description

#### A. Overall setting and context

Located in northeastern Illinois, Chicago O'Hare International Airport (ORD, also referred to as "O'Hare" or "the airport") occupies an approximately 8,200-acre site that straddles the Cook/DuPage County line to include areas within the city limits of Chicago, Des Plaines, Schiller Park, and Rosemont. The airport is sited approximately 17 miles northwest of Chicago's Central Business District and a variety of light industrial, commercial, residential, and public land uses surround the airport property. The airport itself consists of a central group of terminals (Terminals 1, 2, 3, and 5) encircled by taxiways and surrounded by runways (see Figure 1). Cargo facilities are located at southeast, southwest, and northeast portions of the airport. The general aviation facility is in the northeast corner of the airport, and fuel storage facilities are located at the northwest corner. Public surface parking areas are located along the central and northeast portions of the airport. The Federal Aviation Administration (FAA) North Control Tower is located in the northwest corner of the property, while the FAA South Control Tower is located in the cargo facilities area on the southwest side of the airport. Other support facilities in the areas on the south, northwest, and northeast portions of the property include those for airline support and maintenance, aircraft rescue and firefighting, a post office, and Transportation Security Administration (TSA).

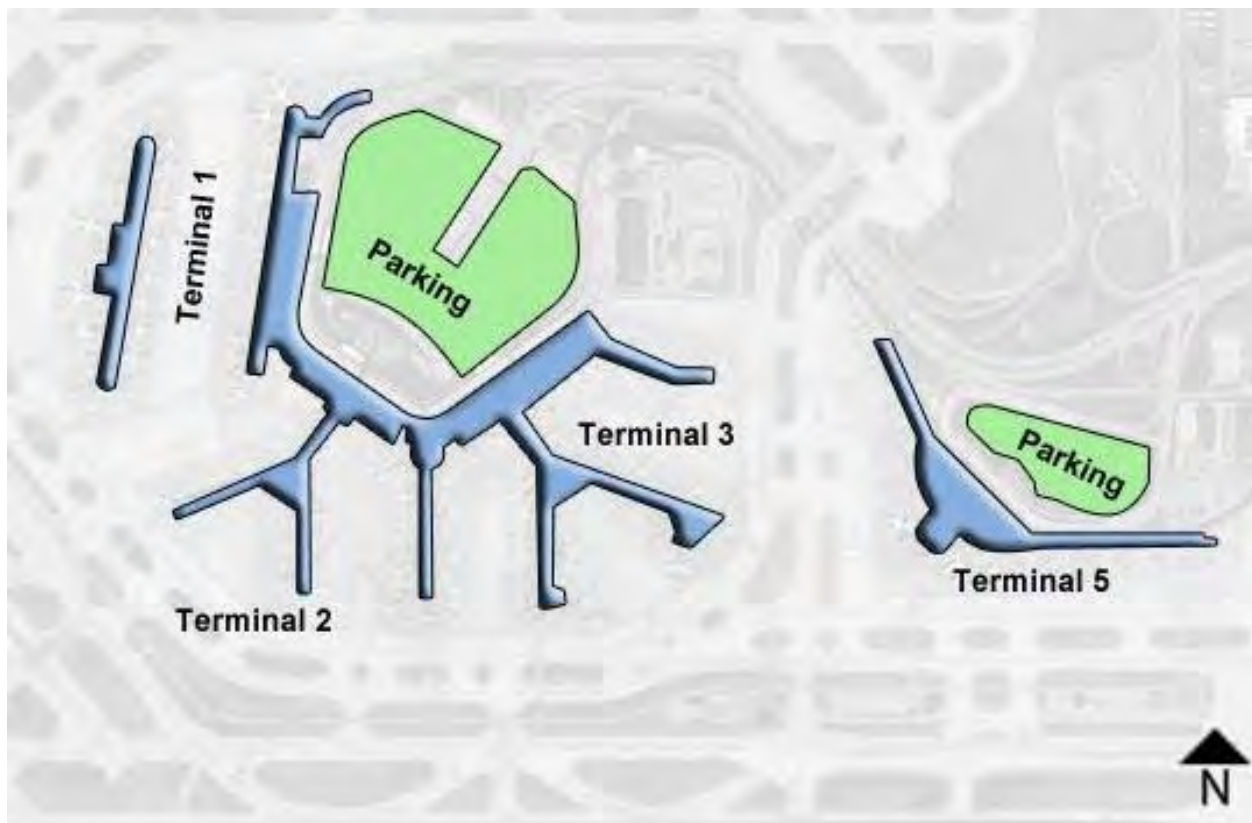


Figure 1. Map of terminals and parking areas at ORD.<sup>1</sup>

<sup>1</sup> "Chicago Ohare (ORD) Airport Terminal Map," *IFly.Com*, accessed June 5, 2019, <https://www.ifly.com/chicago-ohare-international-airport/terminal-map>.

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At the center of the property, Terminals 1, 2, and 3 form the Terminal Core Area, arranged in a U-shaped plan that opens to the northeast. The O'Hare Heating & Refrigeration Plant Complex (H&R Plant), including its associated cooling towers and substations, is located at the northeast corner of the Terminal Core Area. The interior of the U is occupied by two large parking lots, bisected by a central roadway that provides access to the Elevated Parking Building. Terminal 1 forms the west side of the U-plan. The O'Hare Hilton Hotel is located between the Elevated Parking Building and Terminal 2 (the base of the U), and the City of Chicago Department of Aviation (CDA) Control Tower (formerly an FAA control tower) is centered on a grassy plaza that separates the hotel from Terminal 2. The Rotunda links Terminals 2 and 3 at the southeast corner of the U, and the FAA Main Control Tower is located immediately adjacent. The outside of the U formed by Terminals 1 to 3 is occupied by a total of 168 contact gates and 15 remote hardstands.<sup>2</sup> Terminals 2 and 3 have concourses that extend onto the aprons in a perpendicular or Y shape, while Terminal 1 has a concourse (Concourse B) with gates along the west side of the main terminal building and a separate, parallel concourse (Concourse C) accessed via an underground tunnel.

Interstate Highway 190 (I-190) and the Chicago Transit Authority (CTA) O'Hare Rapid Transit Blue Line Rail Service enter the airport from the east. The Blue Line follows the central roadway to the main parking area, where the O'Hare CTA Station is located below ground. The Airport Transit System (ATS) links the three domestic terminals, the international terminal, and the long-term parking area to the northeast by rail; the ATS is accessible via a transfer station from the Metra commuter rail service. Within the Terminal Core Area, the ATS tracks and a two-level vehicular circulation roadway separate the parking lot, garage, hotel, and CDA control tower from the terminals. The upper roadway level provides access to the ticketing area for departing passengers while the lower level provides access to the baggage claim and transportation for arriving passengers. ATS stations are located opposite each of the three terminals (as well as at Terminal 5) and are linked via covered pedestrian walkways across the roadway.

### B. Overview of the Heating & Refrigeration Plant

The H&R Plant is a multi-building complex located at the northeast corner of the Terminal Core Area between the airport's main parking lots and I-190 (Kennedy Expressway). Several buildings and structures not directly associated with the H&R Plant complex are also located in the area, including the O'Hare Telephone Building and Garage, a FAA navigational aid, and a Commonwealth Edison substation. The H&R Plant consists of the main H&R Building situated adjacent to the terminal arrival/departure access road; the north, south, and east water cooling towers east of the main building; and two substations east of the cooling towers (see Figure 2).<sup>3</sup> Parking areas are located along the east and west sides of the H&R Building and along both sides of each of the three cooling towers. Sidewalks and a fenced, landscaped area are located along the H&R Building's west (front) elevation, between the parking areas and the building. Sidewalks lead to a seating area outside the H&R Building's main entrance with benches, trash cans, and concrete flower beds.

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<sup>2</sup> Aircraft parked at remote hardstand positions are accessed via shuttle bus rather than jet bridge.

<sup>3</sup> The main H&R Building is CDA building number 450 while the north, south, and east water cooling towers are CDA building numbers 456, 457, and 460 and the two substations are CDA building numbers 451 and 472.

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Figure 2. Overview map of the H&R Plant complex.

The H&R Plant houses the central heating and cooling systems serving much of the airport. Its primary function is to provide high-temperature and chilled water for use in independently controlled air conditioning and heating systems in various buildings throughout the airport, including Terminals 1, 2, 3, and 5, the FAA Main Control Tower, the CDA Control Tower, and the O'Hare Hilton Hotel. High-temperature water generators and chillers located on the ground level of the main H&R Building produce high-temperature (400°F) and chilled (42°F) water, which is delivered via thousands of feet of pipes inside the airport's extensive utility tunnel system. O'Hare's utility tunnel includes a 7,200-foot main utility tunnel and 8,000 feet of branch tunnels extending to each of the terminals and concourse buildings. As it flows throughout the system, the high-temperature and chilled water is received by a series of converters and independent packaged air handling units located within or near each building. After reaching specified temperatures, water is returned through the tunnel system back to the H&R Plant for treatment and reuse. Water in the refrigeration system is cooled by one of the plant's three cooling towers (CDA building numbers 456, 457, and 460) before it is recirculated through the chillers inside the H&R Building.<sup>4</sup>

<sup>4</sup> Chicago Department of Aviation, *Heating and Refrigeration Plant: O'Hare International Airport* (Chicago: Chicago Department of Aviation, c 1998), Chicago Department of Aviation.



## Section 1 Description

The H&R Plant serves several other functions in addition to heating and cooling airport buildings. Two thermal snow melting systems, located in the basement of the H&R Building, heat the taxiway bridges “Alpha” and “Bravo” over I-190 to keep them clear of ice and snow in the winter months. The plant also contains several large reservoirs and a chlorinator to provide clean potable water for domestic use (e.g., bathrooms, drinking, cleaning, cooking) throughout the airport. The same high-temperature water system that serves to heat the buildings also provides hot water and steam for these domestic uses.<sup>5</sup>

### C. Heating & Refrigeration Building

#### (1) Overview

The main H&R Building is a modern utilitarian building with expansive glass and an exposed steel structural system (see Figure 3). The building measures a total of 80,700 square feet and includes a ground level, first mezzanine level, second mezzanine level, and basement level. The H&R Building incorporates the original 1962 structure measuring approximately 27,410 square feet as well as two major expansions that significantly enlarged the original footprint. The north addition, completed in 1974 (approximately 17,420 square feet), extended the footprint to the north, and the west addition, completed in 1987 (approximately 35,870 square feet), spans the entire west elevation of the building.<sup>6</sup> The architecture of each expansion project incorporated the same design elements and materials as the original building, resulting in the integrated and cohesive exterior appearance of the building today (see Figure 4). The expansions are more evident throughout the building's interior and are indicated by columns and window walls within these interior spaces (described below).



Figure 3. Overview of H&R Building, view facing northeast.

<sup>5</sup> Chicago Department of Aviation, *Heating and Refrigeration Plant: O'Hare International Airport*.

<sup>6</sup> Approximate building measurements taken from CADD Services for the Chicago Department of Aviation, “Floor Plan, H & R Plant Ground Floor Areas” (Chicago Department of Aviation, January 15, 2014), Courtesy of the Chicago Department of Aviation.

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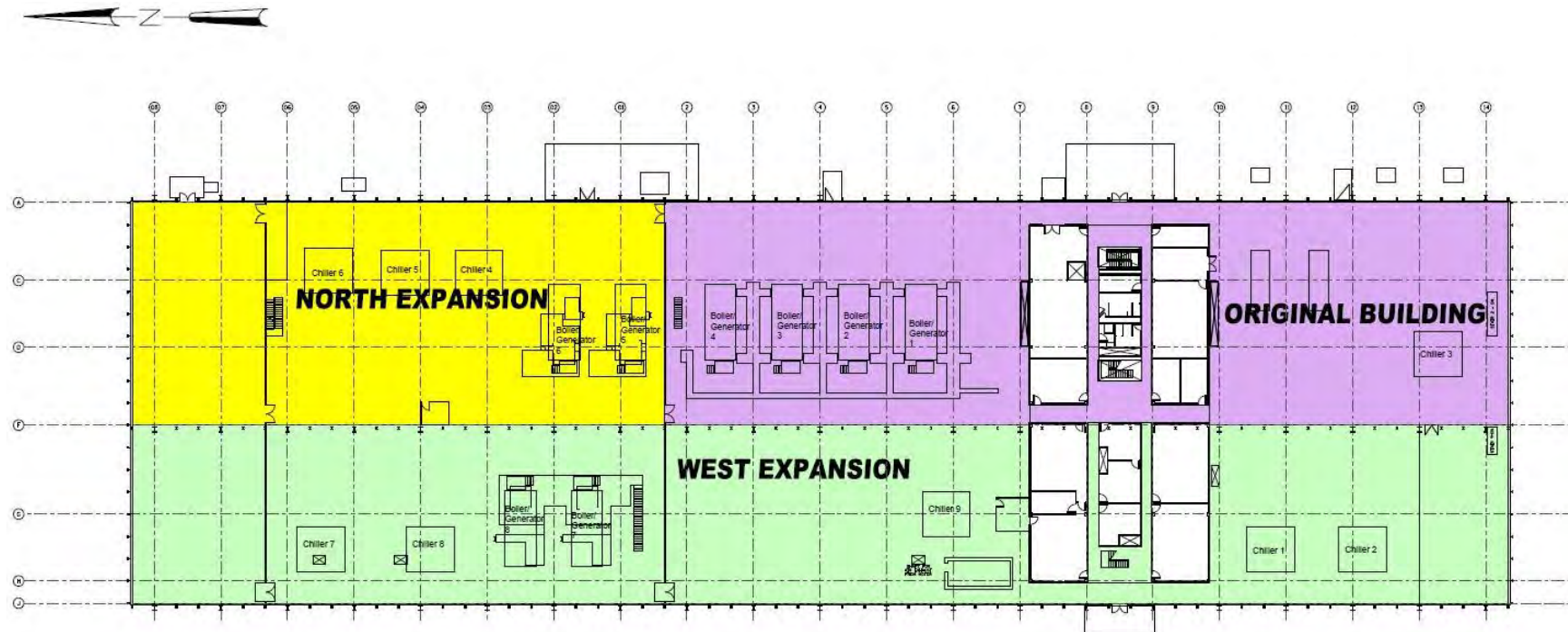


Figure 4. Ground-level floorplan of the H&R Building showing multiple expansions.<sup>7</sup> The north addition was completed in 1974 and the west addition in 1987. Drawing courtesy of the Chicago Department of Aviation.

<sup>7</sup> CADD Services for the Chicago Department of Aviation, "Floor Plan, H&R Plant Ground Floor Areas" (Chicago Department of Aviation, January 15, 2014), courtesy of the Chicago Department of Aviation. Drawing cropped and edited to remove dates.

## Section 1 Description

### (2) Exterior

The H&R Building is a rectangular-plan, three-story building that rests on a concrete foundation. It has an exposed steel structural system that consists of regularly spaced steel columns set in concrete footings in front of the exterior window wall plane and horizontal steel framing encircling the bottom and top of the building (see Figure 5). The lower horizontal steel framing extends beyond the outer edge of the foundation to create the illusion that the building is floating. The structural steel frame supports curtain walls consisting of square tinted glass windows with two evenly spaced vertical steel mullions between each steel support column (see Figure 6). Most of the exterior windows are fixed, but the lowest row of windows on the front (west) and rear (east) elevations have sliding windows at every other opening (see Figure 7). At the time of field review in summer 2019, several exterior windows were covered with plywood and planned for future replacement. (see Figure 8). The H&R Plant is also in the process of replacing several high-temperature water generators; temporary metal overhead sliding doors were installed along the west elevation to facilitate these replacements (see Figure 9).

Centered on the west elevation, the main entryway consists of two paired, metal-frame doors with single lights (see Figure 10). The east elevation has a small metal access platform with stairs near its north end that serves as a secondary employee entrance. Two larger, utilitarian, metal and concrete platforms for loading and unloading equipment are located along the east elevation. Another small metal access platform is located at the east end of the south elevation. The building's roof is flat, clad in metal decking and has various mounted mechanical equipment. Four cylindrical concrete and four cylindrical metal exhaust stacks protrude near the center of the roofline and four smaller cylindrical metal exhaust pipes are situated at the north end of the roof.



*Figure 5. Overview of H&R Building, view facing southwest.*



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*Figure 6. Overview of east elevation and structural system of H&R Building, view facing southwest. Loading docks visible at left.*



*Figure 7. Exterior detail of sliding and fixed windows.*

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*Figure 8. Elevated platform at a secondary entrance, temporary plywood for window replacements, and building overhanging the foundation on the south elevation, view looking west.*



*Figure 9. Temporary metal overhead sliding doors on west elevation to facilitate replacement of high-temperature water generators within the building.*



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*Figure 10. H&R Building main entrance on west elevation, view looking east.*

### (3) Ground level interior

The H&R Building's ground-level interior consists of open utilitarian spaces separated by steel columns and glass window walls, and a two-story central administrative core that has a concrete structural frame infilled with concrete masonry unit (CMU) and hollow metal frame window partition walls (see Figure 11). The building's primary entry at the west elevation and the secondary employee entry at the east elevation are aligned with this central administrative core. Entry points lead to two parallel, east-west-oriented passageways that provide access to offices, conference rooms, and a central service area between the passageways, including bathrooms, storage spaces, and stairwells. At the ground level, a north-south passageway bisects the central administrative core to allow movement between the open utilitarian areas north and south of the administrative core (see Figure 12).

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*Figure 11. View of the east side of the two-story central administrative core and secondary entry to the right.*

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*Figure 12. View of the north-south passageway bisecting the central administrative core.*

The administrative core primarily consists of offices and conference rooms with full-length, hollow, metal-framed, glass window walls and doors with transoms. Both parallel, east-west passageways have CMU walls and feature full-length hollow metal doors (see Figure 13). The ground level has an epoxy floor. Ceilings within the passageways are dropped with soffit perimeters and surface-mounted 12-by-12 lighting. Three stairwells are located within the central service area between the parallel hallways and provide access to the building's other levels (see Figure 14). Offices and conference rooms on the ground level are typically carpeted with acoustic tile ceilings. Perimeter window walls provide views of interior utilitarian spaces and exterior views through the building's glass exterior walls (see Figure 15).



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Figure 13. View of the north-south passageway showing full-length plate glass walls, glass doors with transoms, and dropped ceiling with surface mounted fluorescent lighting.

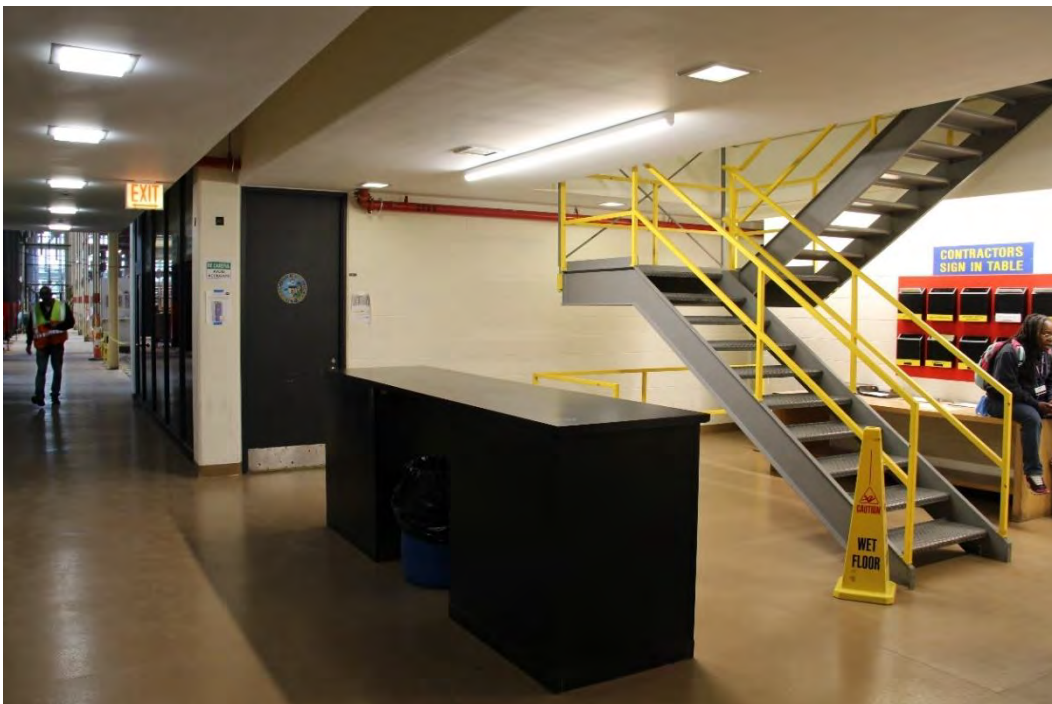


Figure 14. Stairwell providing access to first and second mezzanine levels.

## Section 1 Description



*Figure 15. Typical office space interior.*

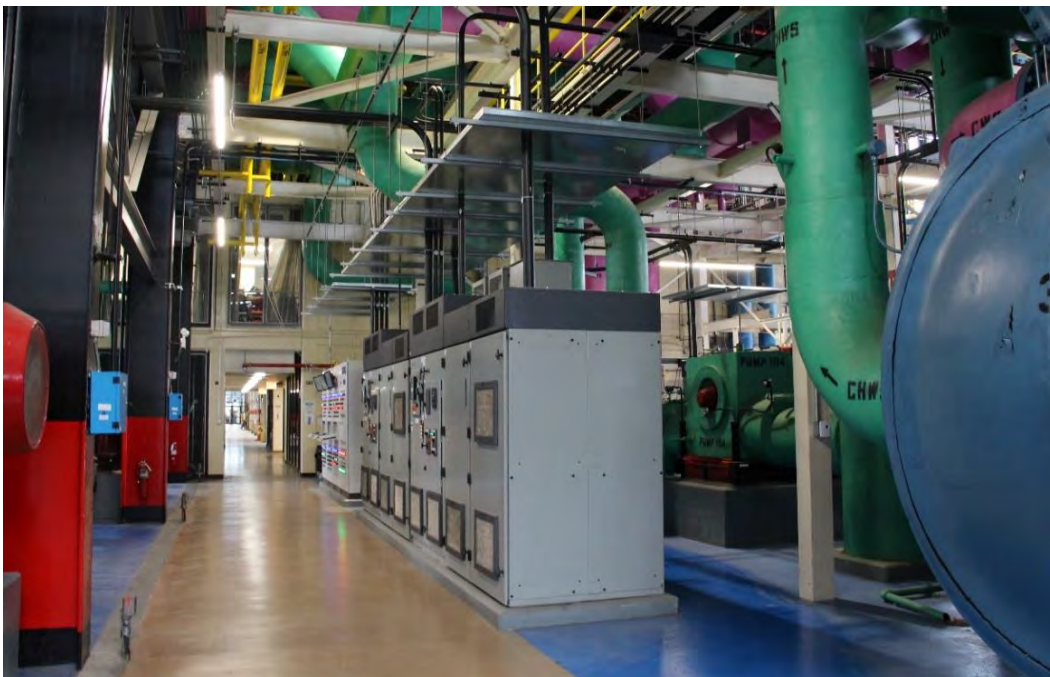
Surrounding the central administrative core is an expansive, three-story, utilitarian space containing the plant's primary heating and refrigeration equipment, including high-temperature water generators, chillers, and various associated pumps, pipes, reservoirs, and auxiliary electrical equipment. The north-south passageway continues beyond the central administrative core into the utilitarian space as an open designated access aisle. The original plant configuration consisted of a heating side north of the administrative core and a refrigeration side to the south. Equipment in the original building area has been upgraded and replaced over time. At the time of field review in summer 2019, the Plant was in the process of replacing each of the four original generators. Chillers have also been moved, upgraded, and replaced; only one chiller remains in the former refrigeration side of the original building. The original H-shaped steel columns formerly on the west (front) facade of the original 1962 building now line the access aisle on its west side (see Figure 16), and narrower steel columns designate the boundary of the access aisle on its east side between the administrative core and the 1974 north addition window wall. Various control panels line the access aisle intermittently along both sides and some feature elevated metal heat shields to protect the electrical equipment. The abundant natural light passing through the building's glass exterior is supplemented by dropped, exposed, fluorescent tube lights. Floors along the access aisle feature an epoxy finish similar to those within the administrative core passageways (see Figure 17).



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*Figure 16. North-south access aisle showing original H-shaped columns and four high-temperature water generators to the right, view from the second mezzanine level (described below).*



*Figure 17. North-south access aisle showing original H-shaped columns and electrical control panels on the east side.*

An electrical vault enclosed with glass window walls is located at the southwest corner of the building and has two entries from the access aisle; one entry is a pair of metal-frame glass doors, and the other is a single-level, glass, vestibule entry that opens to a staircase leading to the basement level (see Figure 18).

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The vault contains electrical equipment and control panels that serve the plant's chillers and other systems (see Figure 19). Utilitarian fluorescent tube lighting hangs from the ceiling and floors are finished with six-by-six quarry tile.



*Figure 18. Electrical vault at the southwest corner showing window wall enclosure and both entries from the north-south access aisle.*



*Figure 19. View within the electrical vault showing control panels, utilitarian lighting, and quarry tile floors.*



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North of the administrative core, a metal-frame, glass window wall spans east-west across the entire width of the building, separating the original 1962 footprint from the 1974 north addition and dividing the 1987 west addition, which spans across the entire west elevation. Two paired, metal-frame doors in the window wall allow the central access aisle to extend into the northern section of the H&R Building. The space north of the window wall is largely a continuation of the utilitarian spaces to its south. The H-shaped metal columns (see Figure 20) that formerly fronted the west (front) facade of the 1974 north addition (chosen to match the 1962 original building) were left in place during the 1987 expansion and now line west side of the access aisle. The space contains four high-temperature water generators (two on each side of the aisle) and five chillers (see Figure 21); control panels are located along the aisle on both sides. Floors have an epoxy coating or exposed concrete finish. A small, one-story, enclosed operator room with windows and single door is located west of the access aisle (see Figure 22). At the far north end is an enclosed area separated from the rest of the building by a window wall that extends across its width. The space contains emergency turbine generators and associated control panels and is accessed by a pair of metal-frame doors (see Figure 23). The emergency generator area has utilitarian overhead lights and six-by-six quarry tile floors similar to the electrical vault at the south end of the building.



*Figure 20. North-south access aisle showing H-shaped columns formerly on 1974 north addition facade, exposed concrete and epoxy coated floors, view looking north.*

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Figure 21. North-south access aisle showing three chillers located in the 1974 north addition.



Figure 22. Small one-story, enclosed operator room west of the access aisle in the northern section.



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*Figure 23. View within the emergency generator area showing control panels, utilitarian lighting, and quarry tile floors.*

#### **(4) First mezzanine level**

The first mezzanine level is the second floor of the H&R Building's self-contained administrative core, and it includes a similar layout and use of spaces as the ground level (see Figure 24). The first mezzanine level is accessed by three stairwells located within the central core area and contains offices, conference rooms, a plan room, bathrooms, and storage spaces. Two parallel, east-west passageways provide access to the rooms. They feature CMU or hollow metal-frame glass partition walls with metal or glass doors with transoms, gypsum board ceilings with recessed or surface-mounted 12-by-12 lighting, and epoxy or vinyl tile floors (see Figure 25 and Figure 26). Offices and conference rooms feature similar interior finishes as those at ground level, including carpeting, CMU walls, and acoustic tile or gypsum board ceilings (see Figure 27 and Figure 28). Similar to ground-level offices, glass window walls in the first mezzanine level offices and conference rooms located along the perimeter of the administrative core offer interior and exterior views of the H&R Plant's operation areas. Stairwells at the east and west sides of the first mezzanine level open to a railed overlook space (see Figure 29).

## Section 1 Description

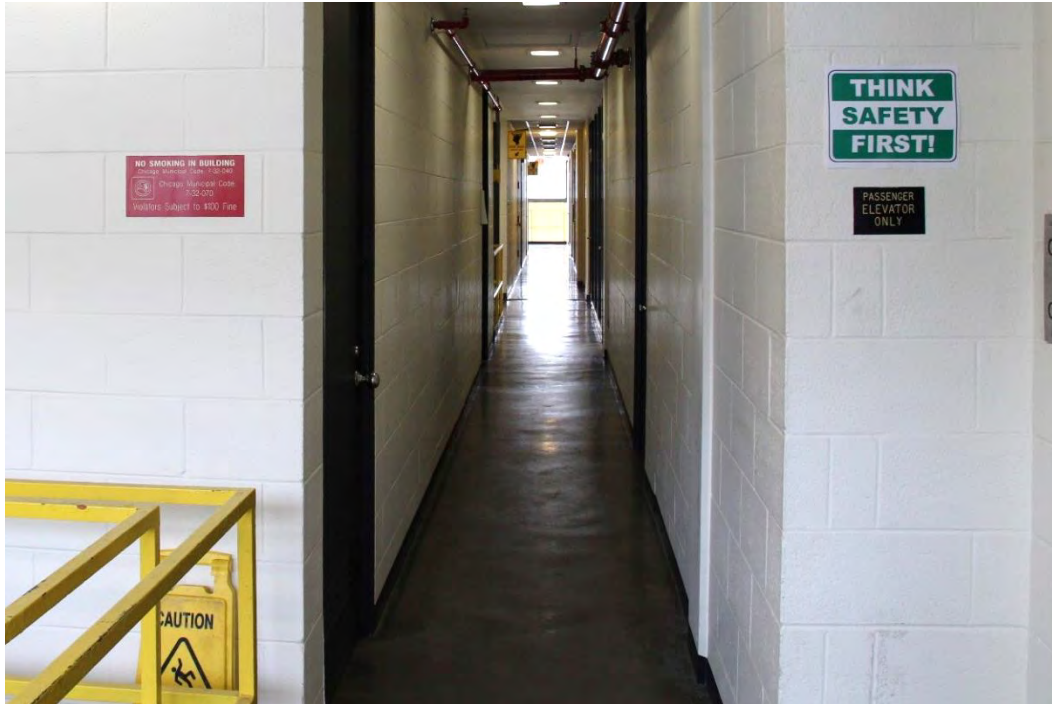


*Figure 24. View of the central administrative core showing first mezzanine level.*



*Figure 25. East-west passageway showing metal and glass walls with metal frame glass doors, gypsum board ceiling with recessed lighting, and vinyl tile floors.*



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*Figure 26. East-west passageway showing CMU walls, hollow metal doors, gypsum board ceiling with recessed and surface-mounted lighting.*



*Figure 27. Typical first mezzanine level office.*

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Figure 28. Office space used as a plan room on the first mezzanine level.



Figure 29. First mezzanine level stairwell.

#### (5) Second mezzanine level

The H&R Building's second mezzanine level consists of open space above the central administrative core and secondary steel structural systems that supports piping, reservoirs, and railed metal catwalks and platforms (see Figure 30). The second mezzanine level is accessed by stairwells in the central service



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core and by several additional sets of metal stairs leading directly to the ground level from the plant's operation areas. The catwalk system has metal grate floors and metal tube railing and extends both north and south of the core. Additional catwalks and upper-level platforms are located in the northern portion of the building and do not appear to be connected to those extending from the southern portion. The second mezzanine level space above the central administrative core is largely open; it contains electrical control equipment and is enclosed by a chain-link fence. Industrial pendant-hung high bay lighting supplements natural light on the second mezzanine level.



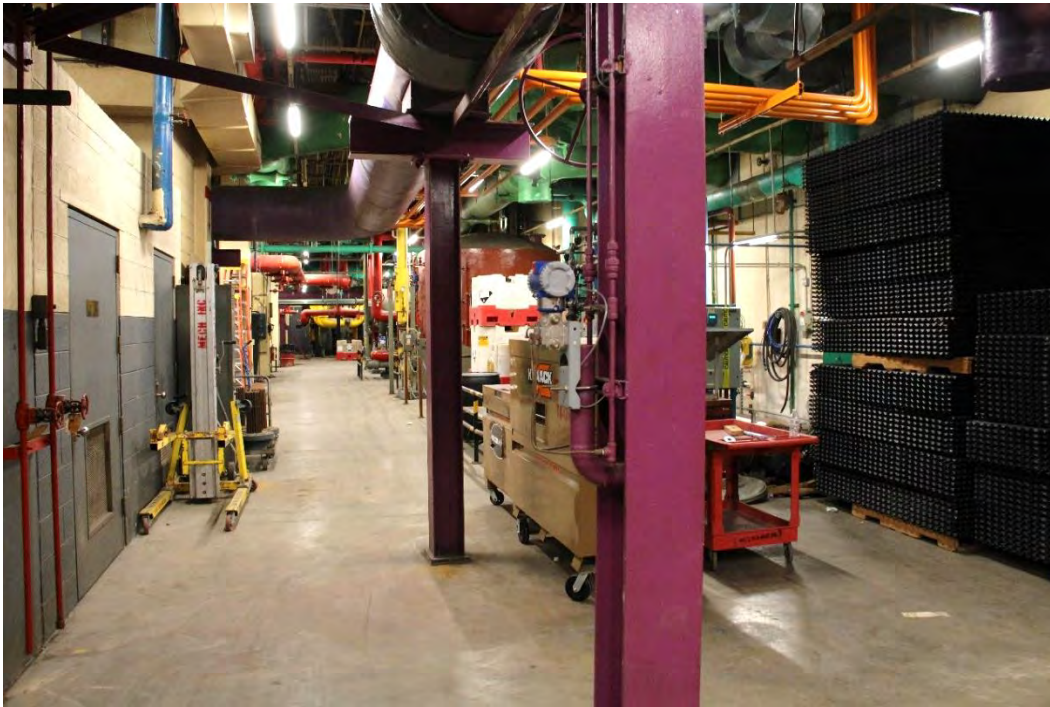
*Figure 30. View from a second-mezzanine-level catwalk showing the secondary structural system supporting piping, platforms, and catwalks, and industrial pendant-hung high-bay lighting.*

### (6) Basement

The basement of the H&R Building is accessed by the east stairwell in the building's central service core and several smaller stairwells, including one south of the 1974 north addition window wall, one south of the turbine generator space, and one within the electrical vault in the southwest corner. Beneath the 1962 original building is a partial basement with open space surrounding the stairwell beneath the central administrative core and north-west passageways along the east side of the building. Two large areas to the northwest and the southwest of the original building basement remain unexcavated. From the central administrative core stairwell, the north-south passageway leads to the 1974 north addition, which consists largely of open space supported by concrete columns. Employee bathrooms, locker rooms, storage, and additional stairwells leading to the ground floor are located at the south end of the addition. The basement level of the 1987 west addition includes three enclosed spaces that are largely separated from the earlier portions by a concrete wall. The airport's extensive utility tunnel system connects to the basement in two locations from the west; one tunnel is on the south end of the building and connects directly to the 1962 original basement, and the other is on the north end and connects to the 1974 north addition. Each tunnel is accessed from the 1987 west addition portion via openings on the north and south. Finishes throughout

## Section 1 Description

all areas of the basement are utilitarian and consist of exposed or painted concrete, CMU walls, industrial metal doors, and dropped fluorescent tube lighting (see Figure 31 and Figure 32).



*Figure 31. Overview from the north end of the basement in the 1974 north addition portion showing walls of CMU, industrial metal doors, and concrete floors. Concrete columns are visible south of the storage area.*



*Figure 32. Overview of the north end of the basement in the 1984 west addition portion. The concrete wall to the left separates the east and west portions of the basement. The opening allows north-south passage through the north tunnel.*



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*Figure 33. Overview of the south end of the basement showing various piping systems and exposed concrete floors and walls.*

The basement contains various pipes, pumps, and other mechanical equipment that are integrated into the heating and refrigeration systems of the overall plant, including several steam generators used for atomizing fuel and condenser pumps that process water between the ancillary cooling towers (described below) and chillers on the ground level (see Figure 33 and Figure 34). In addition, the basement contains several water deionization (purifying) units and tanks as well as the H&R Plant's snow melting systems that service the Alpha and Bravo taxiway bridges over I-190 (see Figure 35). The Bravo unit is located at the northeast corner of the building and the Alpha unit is in a central location within the original 1962 footprint. The H&R Plant's electric shop is located at the south end of the basement, below the electrical vault on the ground floor (see Figure 36).

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**Description**

*Figure 34. Several condensers are integrated into the refrigeration system, processing water from ancillary cooling towers and delivering it to chillers on the ground level.*



*Figure 35. Thermal oil snow melting unit serving the Alpha taxiway bridge.*



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Figure 36. Entrance to the H&R electric shop at the southwest corner of the basement.

### D. Associated buildings: Cooling towers

Three ancillary cooling towers located east of the H&R Building cool water heated by equipment and processes in the H&R Building prior to its recirculation through the building. These include the South Cooling Tower (CDA building number 456), East Cooling Tower (457), and North Cooling Tower (460). The towers cool the water by forcing contact with air that lowers the temperature. Air enters the towers through vents near the bottom of the structures and large overhead fans pull air upwards through the towers. Simultaneously, hot water pumped into the towers flows downward over internal "fill" material. These two processes result in small amounts of water evaporation and lowered water temperatures. The cooled water is collected at the bottom of the towers and then pumped back into the overall system for reuse. Below is a brief description of each cooling tower.

#### (1) South Cooling Tower

The South Cooling Tower (CDA building number 456) was constructed in 1994 to replace the original redwood tower located immediately east of the H&R Building.<sup>8</sup> The two-story structure rests on a concrete foundation and has a rectangular footprint that measures approximately 178 feet by 42 feet. Exterior walls are concrete. Twenty-four large metal louvered vents are located on the east and west elevations (a total of 48) to allow airflow into the tower (see Figure 37). Six large, power-driven, metal fans located on the roof draw air through the tower to help cool the water. The north elevation has a multi-story, metal, roof access stairway and two large intake pipes that bring hot water into the building just above the first story.

<sup>8</sup> Chicago Department of Aviation, *Heating and Refrigeration Plant: O'Hare International Airport*.

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**Description**

*Figure 37. South Cooling Tower, view looking southeast.*

**(2) East Cooling Tower**

The East Cooling Tower (CDA building number 457) was constructed in 2014 and is located east of the South Cooling Tower. The structure rests on a concrete foundation and has a rectangular footprint that measures approximately 178 feet by 34 feet. Exterior walls are clad with corrugated metal; openings near the bottom of the structure enable air to enter the tower (see Figure 38). Six large, power-driven fans located on the roof draw air through the tower to help cool the water. The north elevation has a multi-story, exterior, metal stairway for roof access that stands on a large concrete platform. Large exterior water intake pipes enter the building on the upper portion of the west elevation.



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**Description**

*Figure 38. Overview of East Cooling Tower, view looking west.*

**(3) North Cooling Tower**

The North Cooling Tower (CDA building number 460) was constructed in 2007 is located east of the H&R Building and north of the South Cooling Tower. The structure has a concrete foundation, rectangular footprint, and measures approximately 145 feet by 28 feet. Exterior walls are clad with corrugated metal; openings near the bottom of the structure enable air to enter the tower (see Figure 39). Five large, power-driven fans located on the roof draw air through the tower to help cool the water. The south elevation has a multi-story, exterior, metal stairway for roof access that stands on a large concrete platform. Large, exterior, water intake pipes enter the building on the upper portion of the east elevation.



*Figure 39. Overview of North Cooling Tower, view looking northwest.*

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### E. Associated buildings: Substations

Two city substations located east of the cooling towers control voltage and electricity distribution for the H&R Plant. The two buildings share a similar building plan and function. Both are one-story, rectangular-plan, flat-roof buildings with concrete-block structural systems and feature large, metal-frame, exterior window walls. The ground-level interior of each substation building contains switchgear equipment used for controlling electrical voltage for the plant. A brief description of each substation is provided below.

#### (1) City Substation

The 1987 City Substation (CDA building number 451) is located east of the H&R Building and beyond the South and East Cooling Towers and measures 40 feet by 52 feet. The one-story substation has a rectangular plan, rests on a poured-concrete foundation, and has a structural system comprised of concrete block. The identical north and south elevations feature five vertical bays separated by rounded steel columns that extend the entire height of the building; the columns are set on small concrete platforms (see Figure 40). Metal panels are mounted on the concrete-block, load-bearing walls between each column. At the western end of the south elevation and east end of north elevation are tall metal-clad entry doors and louvered vents just below the roofline; no windows are present on the north and south elevations. The east and west elevations each consist of 12 steel-frame, tinted and laminated, security glass windows that create a window wall at each end of the building (see Figure 41). The building has a flat roof made of corrugated metal. Metal coping extends along the wall-roof juncture.



*Figure 40. South and west elevations of the City Substation 451, view looking northeast.*

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*Figure 41. East and north elevations of the City Substation 451, view looking southwest.*

The interior of the City Substation includes a ground level and basement level. The ground level consists of a large open room with concrete floor and corrugated metal roof supported by exposed metal bar joists. Metal ductwork and fluorescent lighting is suspended from the ceiling. A free-standing, I-shaped, concrete-block partition wall is located toward the east end of the room (see Figure 42). The northern half of the first floor has switchgear equipment for controlling voltages and electricity distribution (see Figure 43); the switchgears are fed conduit from the basement through stub-ups (holes) in the floor. Additional stub-ups are located on the south end of the room. The basement level is accessed by metal ladders at the southeast and northwest corners of the first floor, each surrounded by a metal safety railing. The basement level is a large room with concrete floors and square, concrete, structural columns. Equipment in the basement includes a conduit penetration panel that feeds conduit lines through pipes to pole boxes, which feed the switchgears on the first floor, and two concrete-encased conduits that bring in electricity from a nearby Commonwealth Edison Substation (see Figure 44).



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*Figure 42. Interior of the City Substation. Switchgear equipment is visible at left, the free-standing concrete-block wall is visible at center, and an access ladder for the basement is visible in the background.*



*Figure 43. Switchgear equipment on first floor of the City Substation.*

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*Figure 44. Basement level of the City Substation, with concrete-encased conduit visible at right.*

#### (2) RB 40 Substation

The RB 40 Substation (CDA building number 472) was completed in 1984 and is located northeast of the H&R Building. The one-story building measures 40 feet by 72 feet with a rectangular plan, poured-concrete foundation, and structural system comprised of concrete block (see Figure 45 and Figure 46). The identical north and south elevations feature seven vertical bays separated by rounded steel columns that extend the entire height of the building; the columns are set on small concrete platforms. Metal panels are mounted on the concrete-block, with load-bearing walls stretching between each column. At the eastern end of the south elevation and west end of the north elevation are tall, metal-clad, entry doors and louvered vents just below the roofline; no windows are present on the north and south elevations. The east and west elevations each consist of 12 steel-frame, tinted and laminated, security glass windows that create a window wall at each end of the building. The building has a flat roof made of corrugated metal. Metal coping extends along the wall-roof juncture.



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*Figure 45. North and east elevations of the RB 40 Substation, view looking southeast.*



*Figure 46. South and west elevations of the RB 40 Substation, view looking northeast.*

The interior of the RB 40 Substation includes a ground level and basement level. The ground level consists of a large open room with a concrete floor and corrugated metal roof supported by exposed metal bar joists (see Figure 47). Metal ductwork and fluorescent lighting is suspended from the ceiling. A freestanding, irregularly shaped, concrete-block wall is located in the northwest quarter of the room and encloses a small utilitarian room with an overhead faucet and raised drain basin at its west end. Two parallel rows of switchgears and switchboards fill most of the first-floor space and are used for controlling voltages and electricity distribution (see Figure 48); the switchgears are fed conduit from the basement through stub-ups in the floor. A row of batteries lines the north wall of the interior and are used as backup power. The basement level is accessed by a metal ladder at the southwest and northeast corners of the first floor, each surrounded by metal safety railing. The basement level is a large room with concrete floors and square concrete structural columns. Equipment in the basement includes a concrete-encased conduit that brings electricity in from the nearby Commonwealth Edition substation and feeds the first-

## Section 1 Description

floor switchgear and switchboards (see Figure 49). Other various pipes and conduit hang from the basement ceiling.



*Figure 47. Overview of the interior of the RB 40 Substation.*



*Figure 48. Switchgear and switchboards on the interior of the RB 40 Substation.*



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*Figure 49. Basement of the RB 40 Substation, with concrete-encased conduit shown entering the building at center and background.*

### F. Summary of alterations

A summary of the alterations to the H&R Plant is presented below in chronological order:

- 1974: North addition of the H&R Building completed – addition on north elevation and expansion of basement.
- 1974: Cooling tower constructed east of the H&R north addition (now nonextant).
- 1977: Emergency turbine generators moved from south of the building to the north addition location.
- 1984: Current RB 40 Substation constructed; preexisting RB 40 equipment located south of the AT&T building removed.
- 1987: West addition of the H&R Building completed – addition on west elevation and expansion of basement.
- 1987: Cooling tower constructed east of original cooling tower during H&R expansion project (now nonextant).
- 1987: City Substation constructed.
- 1994: Original wood cooling tower demolished and replaced with concrete South Cooling Tower.
- 2006: 1974 cooling tower demolished and replaced with current North Cooling Tower.
- 2014: 1987 cooling tower demolished and replaced with current East Cooling Tower.
- Continuous: Modifications/modernization of administrative spaces and in-kind replacement of exterior windows.



**Section 1**  
**Description**

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## Section 2

### Statement of Significance

## 2. Statement of Significance

### A. History of O'Hare International Airport

The first municipal airport to serve Chicago was Chicago Municipal Airport, later renamed Midway Airport, which opened in 1927 on the southwest edge of the city. Due in part to Chicago's central location within the country, passenger traffic at Chicago Municipal increased over 600 percent between 1931 and 1943. By the early 1940s the airport was operating well beyond its capacity. While Chicago's location within the country was a boon to business, the airport's location within the city was not. Surrounded by growing neighborhoods, Chicago Municipal had no room to grow. The need for more space to accommodate the ever-growing number of passengers and larger aircraft prompted the City of Chicago (City) to search out a location for a new airport.<sup>9</sup>

The development of O'Hare International Airport (O'Hare or "the airport") began in 1942 when the federal government purchased 1,000 acres near the hamlet of Orchard Place on the northwest outskirts of Chicago, which it leased to Douglas Aircraft (Douglas) to build and operate a factory constructing troop transports during World War II. The Orchard Place location was chosen for its proximity to established rail lines and a suburban work force. The Douglas factory closed its doors at the end of the war, but the expanded facilities and potential for future growth made Orchard/Douglas Field an ideal site for the City to build a new and larger airport (see Figure 50). The federal government donated the airport property to the City, and the first commercial flights at Orchard/Douglas Field began in 1946. The airport was renamed Chicago O'Hare International Airport in 1949 in honor of the Chicago-born pilot Edward H. "Butch" O'Hare, who had been shot down in the Pacific during World War II. The village of Orchard Place was eventually absorbed by the expanding airport, but its legacy lives on in the airport identifier for O'Hare, ORD.<sup>10</sup>

Plans were quickly drafted to develop O'Hare into a major international airport that could support the increasing demand at Midway and in the region. City planner Ralph H. Burke drafted O'Hare's first master plan in 1948, envisioning a design with multiple "split-finger" terminals extending from a central "grand concourse," with a single roadway leading to parking areas fronting the central concourse. Burke's plan took a few years to materialize and his complete design was never fully constructed. By the time of his death in 1956 only one terminal (the original Terminal 1) had been completed.<sup>11</sup>

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<sup>9</sup> David Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," in *Chicago Architecture and Design 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: The Art Institute of Chicago and Perstel-Verlog, 1993), 80–83.

<sup>10</sup> Richard P. Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)* (Muncie, Ind.: Ball State University, 1970), 9–11, 27; Anne Royston, "Chicago-O'Hare International Airport," in *AIA Guide to Chicago* (San Diego, New York and London: Harcourt Brace, 1993), 262.

<sup>11</sup> Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," 85–86; Royston, "Chicago-O'Hare International Airport," 262; "The Fascinating History of Chicago's O'Hare International Airport 1920-1960," *Airways*, April 7, 2014, <https://airwaysmag.com/2014/04/07/chicago-ohare-history/>.

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Figure 50. Overview of the locations and relative size of Midway Airport (Chicago Municipal Airport) and the proposed O'Hare (Orchard Place/Douglas Field) facilities in relation to the city of Chicago, 1948.<sup>12</sup>

<sup>12</sup> Ralph H. Burke, *Master Plan of Chicago Orchard (Douglas) Airport* (Prepared for the City of Chicago, January 1948), 21, available in Transportation Library Digital Collections: Chicago O'Hare International Airport, <https://archive.org/details/masterplanofchic00burk>, Northwestern University Transportation Library.

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Following the construction of the first terminal, new jet liners introduced in the late 1950s revealed the shortcomings of Burke's initial plan. New aircraft such as the Boeing 707 and Douglas DC-8 not only carried twice as many passengers as earlier commercial aircraft but required longer runways and more space at the terminal gates to accommodate wider wingspans. In 1955 Mayor Richard Daley commissioned the architectural firm Naess & Murphy, renamed C.F. Murphy Associates (C.F. Murphy) in 1960, to review Burke's original plan and build upon it with larger terminals and greater automobile access. C.F. Murphy partnered with the Cincinnati-based firm Landrum & Brown to complete the new airport design.

Terminals 2 and 3 were completed in 1961 and officially opened in 1962 (see Figure 51). The Rotunda building, built between the two terminals, was completed in 1962. The original Terminal 1 building then became the airport's international terminal. The new airport design also included support and service-oriented buildings, consisting of hangar and cargo facilities, the main H&R Building, and a single cooling tower.<sup>13</sup>



Figure 51. View of Terminal 2 at night, 1962.<sup>14</sup>

In 1962, following the completion of Terminals 2 and 3, operations at Midway Airport were transferred to O'Hare, which soon became, and has remained, one of the busiest airports in the United States.<sup>15</sup> Every

<sup>13</sup> Royston, "Chicago-O'Hare International Airport," 262–63; Leonard R. Bachman, *Integrated Buildings: The Systems Basis of Architecture* (Hoboken, N.J.: John Wiley & Sons, 2003), 220; *Airport Cooperative Research Program Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook* (Washington, D.C.: Transportation Research Board, 2010), 6; Michael Branigan, *A History of Chicago's O'Hare Airport* (Charleston, S.C.: The History Press, 2011), 82, 86.

<sup>14</sup> Kori Rumore, "From Farmland to 'Global Terminal': A Visual History of O'Hare International Airport," *Chicago Tribune*, March 27, 2019, <https://www.chicagotribune.com/news/ct-ohare-international-airport-development-history-timeline-htmlstory.html>.

<sup>15</sup> The transfer of operations from Midway was temporary as flights returned to Midway in 1964. "Chicago Department of Aviation | O'Hare and Midway International Airports," *Midway History*, accessed July 31, 2019, <https://www.flychicago.com/business/CDA/Pages/Midway.aspx>.



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major American city could be reached from Chicago on relatively short flights, which established O'Hare as a primary location for connecting flights across the country.<sup>16</sup> The fact that O'Hare had been specifically designed to accommodate the jet liners of the 1950s and 1960s added to its importance as a major airport.<sup>17</sup> Further improvements to O'Hare completed in the early 1970s included a new control tower, an airport hotel and parking garage. Airport improvements also included expansions to support and service facilities, including a major expansion on the north end of the main H&R Building to accommodate additional equipment and the addition of a second cooling tower.

O'Hare's importance as a connecting airport increased following the Airline Deregulation Act of 1978. Among other facets, the legislation allowed airlines to establish hubs at specific airports by trading and sharing routes. While Trans World Airlines (TWA) and other airlines had established small hubs previously, the phenomenon took off in the early 1980s. Delta Airlines built a large hub in Atlanta, American Airlines focused its hub at Dallas-Fort Worth, and United Airlines established its major hubs at O'Hare and Denver's Stapleton Airport.<sup>18</sup>

In 1982 the Chicago Department of Aviation (CDA) launched the O'Hare Development Program (ODP) to expand O'Hare's capacity by 1995. The plan included a new Terminal 1 building, expansion of Terminals 2 and 3, addition of Concourse L, building a new international terminal (Terminal 5), addition of the Airport Transit System (ATS or "people mover") to transport travelers to more distant parking areas, and further expansions to service-oriented facilities such as the H&R Plant (see Figure 52).<sup>19</sup> In addition to the ODP, the Chicago Transit Authority (CTA) constructed a new rail transit station beneath the parking garage and hotel, which was completed in 1984.<sup>20</sup>

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<sup>16</sup> Joseph P. Schwieterman, *Terminal Town: An Illustrated Guide to Chicago's Airports, Bus Depots, Train Stations, and Steamship Landings, 1939-Present* (Lake Forest, Ill.: Lake Forest College Press, 2014), 2.

<sup>17</sup> "Chicago O'Hare International Airport, Crossroads of the World," *Chicago Tribune*, April 7, 1963, sec. 7A: Your Chicago Today.

<sup>18</sup> Bachman, *Integrated Buildings: The Systems Basis of Architecture*, 220; "The Fascinating History of Chicago's O'Hare International Airport 1920-1960"; "Chicago O'Hare Airport Becomes America's Busiest Airport Again," *International Airport Review*, February 6, 2019, <https://www.internationalairportreview.com/news/80867/ohare-americas-busiest-airport/>.

<sup>19</sup> "The Fascinating History of Chicago's O'Hare International Airport 1920-1960"; Robert Davis, "United Plans \$100 Million New Terminal at O'Hare," *Chicago Tribune*, September 20, 1980; David Young, "United Plans New O'Hare Terminal," *Chicago Tribune*, December 10, 1982; John Camper, "O'Hare Project Picks up: Expansion Enters Peak Year of Construction," *Chicago Tribune*, March 1, 1987; O'Hare Associates, "Progress Report, Chicago-O'Hare International Airport Development Program, June 1984," 1; Gary Washburn, "World at City's Doorstep as New O'Hare International Terminal Takes Wing," *Chicago Tribune*, May 28, 1993.

<sup>20</sup> "The Fascinating History of Chicago's O'Hare International Airport 1920-1960"; Robert Davis, "United Plans \$100 Million New Terminal at O'Hare," *Chicago Tribune*, September 20, 1980; David Young, "United Plans New O'Hare Terminal," *Chicago Tribune*, December 10, 1982; John Camper, "O'Hare Project Picks up: Expansion Enters Peak Year of Construction," *Chicago Tribune*, March 1, 1987; O'Hare Associates, "Progress Report, Chicago-O'Hare International Airport Development Program, June 1984," 1; Washburn, "World at City's Doorstep as New O'Hare International Terminal Takes Wing."

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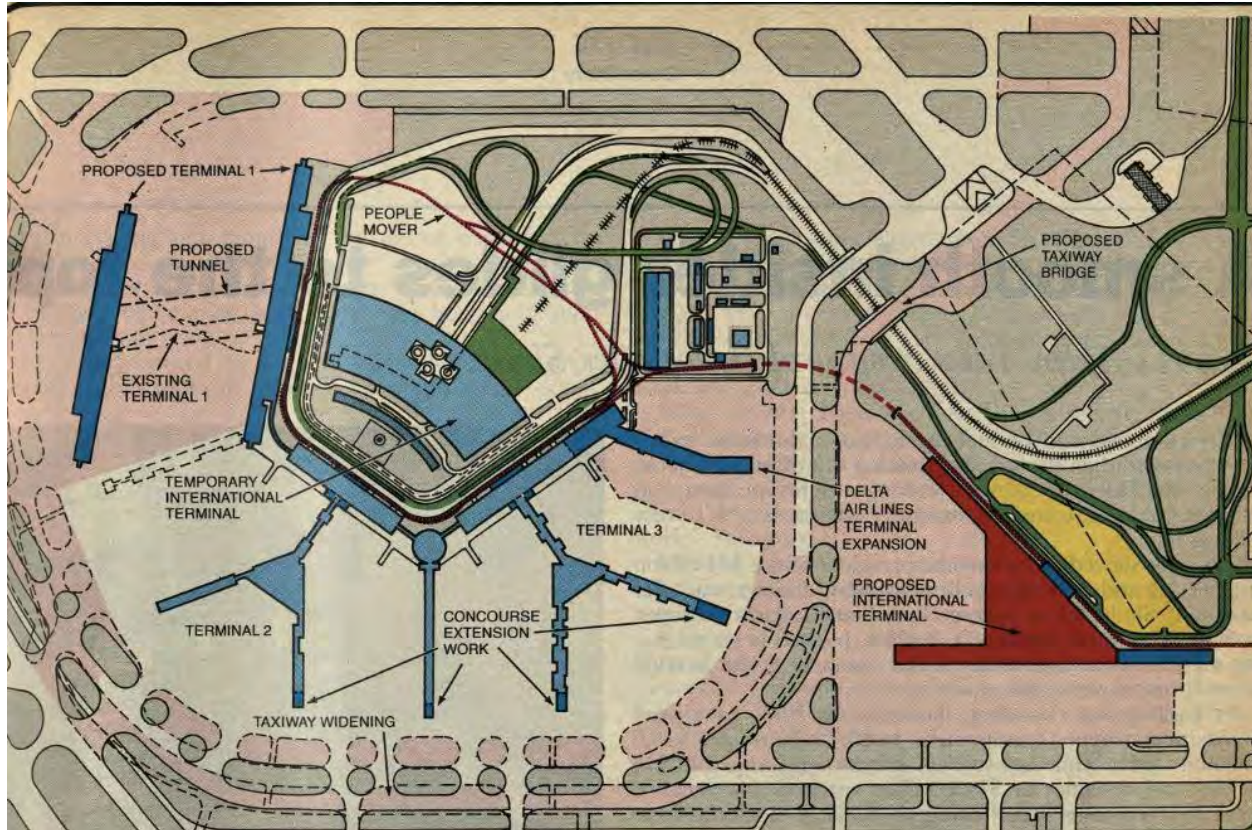


Figure 52. Overview of O'Hare Development Program, 1984.<sup>21</sup>

Further improvements to O'Hare included the construction of three FAA control towers: the Main Control Tower built in 1996 near the present CDA control tower, the North Control Tower in 2008, and the South Control Tower in 2015. In 2005 the main facades of Terminals 2 and 3 were extended and a consistent roadside canopy was constructed across all three terminals, replacing the original canopy outside Terminal 1. The most recent addition to O'Hare was the construction of the "stinger" gates in 2018 as an addition to Concourse L, which added five gates.<sup>22</sup>

### B. Evolution of central heating and air conditioning plants

The O'Hare H&R Plant was completed in 1962 as part of the airport's expansion plan designed by Naess & Murphy. The central plant utilized modern heating and air conditioning technology to distribute services on a large scale. The H&R Plant used a high-temperature water (HTW) system for heating and a hermetic centrifugal chiller system for cooling airport buildings. These technologies and the use of central plants have roots dating back to the development of steam and hot water heating in the late eighteenth century and air conditioning in the early twentieth century. This section discusses the evolution of heating and air

<sup>21</sup> "O'Hare Airport Expansion Takes Off," *Engineering News-Record* 212, no. 19 (May 10, 1984): 27.

<sup>22</sup> Janan Hanna, "Busiest Airport Lands in the Future," *Chicago Tribune*, October 1, 1996, sec. 2; John Hilkevitch, "\$65 Million Tower to Give New Bird's Eye View for Controller," *Chicago Tribune*, October 8, 2008, sec. 1; "American Airlines Celebrates Opening of Five New Gates at Chicago O'Hare," *American Airlines Newsroom*, May 11, 2018, <http://news.aa.com/news/news-details/2018/American-Airlines-Celebrates-Opening-of-Five-New-Gates-at-Chicago-OHare/default.aspx>.

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conditioning technology and the development of central heating and cooling plants on large multi-building complexes and airports up to the early 1960s to offer context for the services provided by the H&R Plant.

#### (1) Development of modern central heating technology

Three major central heating methods had developed by the late nineteenth century and carried into the twentieth century: warm air, steam, and hot water. Dating as far back as the Roman empire, one of the earliest central heating methods utilized warmed air created at a single location and circulated under flooring or through systems of ducts or pipes. Advancements in furnace and air duct design and improved mechanical air movers made central warm-air heating one of the more common heating methods for small buildings during the nineteenth century.<sup>23</sup> The use of central warm-air heating continued into the twentieth century; however, heating methods using steam and hot water became more popular for use in larger buildings or complexes.<sup>24</sup>

Steam and hot-water heating both advanced in the late eighteenth and early nineteenth centuries alongside advancements in central hot air heating. Steam worked well as a heating source because, as a gas, it would expand and rise on its own throughout a system of pipes. Then after emitting its heat, the steam turned to water that flowed back to its source.<sup>25</sup> By the mid-1800s steam had become the preferred heating method for large buildings in the United States.<sup>26</sup> Hot water systems functioned similarly to steam, distributing the medium through pipes and coils in walls and baseboards; however, at low pressures liquid water was not easily circulated and required the use of large, bulky pipes. By the 1830s Angier Perkins, an American engineer working in England, developed a high-pressure hot-water system that forced the water through a system of small pipes, which were easier to conceal within buildings than their larger predecessors. Perkins's high-pressure hot water heating system enjoyed a brief period of popularity in England until the 1850s, but its use dwindled in the second half of the nineteenth century. Hot water heating systems were also developed in the United States around 1840 but were primarily used for residential buildings. Steam remained the dominant method for heating large buildings into the early twentieth century.<sup>27</sup>

The concept of high-pressure hot water systems languished until the 1920s, when several applications in Germany led to further development. It had become a familiar heating method in Europe by the outbreak of World War II in 1939 and was widely used for military installations and factories connected to the war effort. After the war, the U.S military introduced high-pressure hot water heating systems on military installations.<sup>28</sup> At some point between the 1920s and the 1950s the high-pressure hot water method

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<sup>23</sup> Robert Bruegmann, "Central Heating and Forced Ventilation: Origins and Effects on Architectural Design," *Journal of the Society of Architectural Historians* 37, no. 3 (1978): 143–46, doi:10.2307/989206.

<sup>24</sup> Bernard Nanengast, "An Early History of Comfort Heating," *The News (Air Conditioning, Heating & Refrigeration News)*, November 6, 2001, <https://www.achrnews.com/articles/87035-an-early-history-of-comfort-heating>.

<sup>25</sup> David Lee Smith, *Environmental Issues for Architecture* (John Wiley & Sons, 2011).

<sup>26</sup> Nanengast, "An Early History of Comfort Heating"; Bruegmann, "Central Heating and Forced Ventilation," 146–47.

<sup>27</sup> Nanengast, "An Early History of Comfort Heating"; Willard G. Shafer, "The Evaluation of Steam and High Temperature Water Heating System Alternatives for a Naval Air Station" (Rensselaer Polytechnic Institute, 1961), x–xii, 1–2.

<sup>28</sup> Shafer, "The Evaluation of Steam and High Temperature Water Heating System Alternatives for a Naval Air Station," 1–2.



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became known as “high-temperature water” or “HTW” heating. HTW system temperatures were defined as at least 300 degrees Fahrenheit (°F) with system pressures of at least 52 pounds per square inch (psi) or higher dependent on increases in temperature to keep the water in a liquid state.<sup>29</sup> HTW systems were seldomly used in the United States outside of military installations until the late 1950s.<sup>30</sup>

#### (2) Development of modern air conditioning

The birth of modern air conditioning, which involved lowering both indoor temperature and humidity, came in 1902 when engineer Willis Carrier developed and installed the first industrial air conditioner in a Brooklyn printing house.<sup>31</sup> Carrier and other engineers continued to experiment and develop smaller and more efficient systems through the 1910s.<sup>32</sup> In 1922 the Carrier Engineering Corporation unveiled the centrifugal chiller, which was smaller, simpler, more efficient, and more reliable than other refrigeration machines. Engineers continued to tweak the technology of chillers through the 1930s, focusing mostly on creating safer, more efficient, and longer lasting chemical refrigerants. By the end of the 1930s the basic technology of industrial centrifugal chillers had been developed and their use was widespread in large buildings across the country.<sup>33</sup>

Air conditioning continued to rise in popularity into the mid-twentieth century. By the mid-1950s it had become “an accepted necessity” according to federal recommendations. In 1955 the Government Services Administration (GSA), the manager of federal offices, courthouses, and post offices, cemented the notion of air conditioning as necessity by requiring all new federal buildings to have air conditioning if outdoor temperatures reached 80°F for a sustained period.<sup>34</sup> Centrifugal chiller machines were frequently used for these large-scale applications into the mid-twentieth century.

#### (3) District heating and central plants

Steam-heated commercial or office buildings in the United States typically contained individual boilers usually located within a basement or designated utilitarian space within the building itself. These large systems were costly and required space and ongoing maintenance at each site. In contrast, centralized systems whereby heat was produced at a single location and distributed to multiple buildings had roots dating to the Roman empire. Successful attempts to implement a central heating plant concept were not developed in the United States until the late 1870s. Hydraulic engineer and inventor Birdsill Holly experimented with a centralized system at his own home using steam distributed to multiple buildings through underground pipes. Although similar centralized heating systems had been developed earlier, Holly improved the concept to a point that allowed for its commercial use. Holly established the Holly

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<sup>29</sup> Shafer, “The Evaluation of Steam and High Temperature Water Heating System Alternatives for a Naval Air Station,” 3–5.

<sup>30</sup> Charles Broder, “Heating & Air Conditioning a Civilian Airport,” *Heating, Piping & Air Conditioning* 30, no. 3 (March 1958): 147.

<sup>31</sup> Susanna Robbins, “Keeping Things Cool: Air-Conditioning in the Modern World,” *OAH Magazine of History* 18, no. 1 (October 2003): 42; Mark H. Huston, “Brief History of Centrifugal Chillers,” *ASHRAE Journal* 47, no. 12 (December 2005): 20–21.

<sup>32</sup> Bernard Nagengast, “Early Twentieth Century Air-Conditioning Engineering,” *ASHRAE Journal*, March 1999, 61.

<sup>33</sup> Huston, “Brief History of Centrifugal Chillers,” 28.

<sup>34</sup> Gail Cooper, *Air-Conditioning America: Engineers and the Controlled Environment, 1900-1960* (JHU Press, 2002), 163.

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Steam Combination Company and first implemented the technology to serve buildings around the town square of Lockport, New York, where he resided. Other steam district heating companies established in the 1880s and set up district heating systems in larger cities. Small portions of New York City and Chicago each had district heating systems by the early twentieth century. Steam companies added additional plants to existing district heating networks as demand for services increased with new construction in a given area.<sup>35</sup>

Along with its commercial use, the central heating plant concept was also employed on large multi-building complexes including university campuses, military bases, and government centers. Central heating plants were sometimes integrated with other utilities distribution systems, such as water filtration and electric power generation. As utilitarian buildings, early central heating plants were designed to meet the service needs of the larger complex and varied in their design. Nevertheless, a review of National Register of Historic Places, Historic American Building Survey (HABS), and Historic American Engineering Record (HAER) documentation for central heating plants constructed between 1900 and 1945 reveals several shared common design features, including: open floorplans with separated mechanical and office or administrative spaces, utilitarian interior finishes, general conformity to the predominant architectural styles of the larger complex, and location adjacent to district buildings to allow for efficient distribution of services through underground piping networks.<sup>36</sup>

The scale and architectural styles of central heating plants varied based on their location and needs of the larger complex. Fewer buildings required less equipment and a smaller plant, while a sizable complex of buildings required a larger plant. Central plants were sometimes designed to complement the architectural aesthetics of the complex or surrounding buildings, and larger plants with high public visibility sometimes represented grand architectural statements. Early examples of central plants that exhibited architectural detailing include the Agricultural Heating Station at the University of Wisconsin College of Agriculture, which was constructed in 1901 in the Richardsonian Romanesque style (see Figure 53), and the Western New Mexico University Heating Plant, constructed in 1909 and exhibiting the Mission Revival Style (see Figure 54).<sup>37</sup> In 1934 the GSA constructed the Art Deco-style Central Heating

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<sup>35</sup> Emmanuelle Gallo, "Skyscrapers and District Heating, an Inter-Related History 1876-1933," *Construction History* 19 (2003): 87–91.

<sup>36</sup> Based on review of National Register, HABS, and HAER documentation for various central heating plants constructed between 1900 and 1945, including facilities located at the University of Michigan, University of Wisconsin, Western New Mexico University, Wright-Patterson Air Force Base, Roosevelt Base, and the U.S. Government Services Administration. See "Central Heating Plant, Washington D.C.," GSA, accessed August 23, 2019, <https://www.gsa.gov/historic-buildings/central-heating-plant-washington-dc>; Robert S. Lange, "U.S. General Services Administration, Central Heating Plant, HABS No. D.C.-383," September 1980, Library of Congress; National Park Service, "Wright-Patterson Air Force Base, Area B, Building 66, Central Heating Plant, HAER No. OH-79-AH," n.d, Library of Congress; National Park Service, "Roosevelt Central Heating Plant, HABS No. CA-2663-C," n.d, Library of Congress; National Register of Historic Places, Agricultural Heating Station, Madison, Dane County, Wisconsin, 85000570; National Register of Historic Places, Heating Plant, Silver City, Grant County, New Mexico, 88001555; Perry C. Satterthwaite, "The Modern Power and Heating Plant at the University of Michigan," *Domestic Engineering* 76, no. 2 (July 1916).

<sup>37</sup> National Register of Historic Places, Agricultural Heating Station, Madison, Dane County, Wisconsin; National Register of Historic Places, Heating Plant, Silver City, Grant County, New Mexico.

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Plant in Washington D.C. which served multiple large government buildings and itself represented a prominent architectural statement (see Figure 55).<sup>38</sup>



*Figure 53. University of Wisconsin, College of Agriculture, Agricultural Heating Station completed in 1901 exhibiting the Richardsonian Romanesque style, which was a popular style of the period and used on several other University of Wisconsin campus buildings.<sup>39</sup>*



*Figure 54. Western New Mexico University Heating Plant completed in 1909 exhibiting the Mission Revival style, which was popular at the time, especially in Western states.<sup>40</sup>*

<sup>38</sup> "Central Heating Plant, Washington D.C."

<sup>39</sup> National Register of Historic Places, Agricultural Heating Station, Madison, Dane County, Wisconsin.

<sup>40</sup> National Register of Historic Places, Heating Plant, Silver City, Grant County, New Mexico.



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*Figure 55. U.S. Government Services Administration Central Heating Plant constructed in 1934 in Washington D.C. in the Art Deco Style, which was commonly used on public buildings in the 1930s. <sup>41</sup>*

The interior spaces of these central plants included open boiler rooms with enough surrounding space for workers to access equipment and control stations. Larger plants typically had one or more enclosed offices and bathrooms located close to equipment spaces with offices and employee areas grouped within in a central area or corner of the building (see Figure 56). Pipes were either buried and insulated, or routed through underground tunnels.<sup>42</sup> One example was the University of Michigan's Heating and Power Plant, constructed in 1914 and connected to other campus buildings via reinforced-concrete tunnels that were up to 8.5 feet wide and 10 feet high (see Figure 57).<sup>43</sup>

<sup>41</sup> Lange, "U.S. General Services Administration, Central Heating Plant, HABS No. D.C.-383."

<sup>42</sup> Based on review of National Register Nominations and HABS/HEAR documentation for various central heating plants constructed between 1900 and 1945, including facilities located at the University of Michigan, University of Wisconsin, Western New Mexico University, Wright-Patterson Air Force Base, Roosevelt Base, and the U.S. Government Services Administration. See "Central Heating Plant, Washington D.C."; Lange, "U.S. General Services Administration, Central Heating Plant, HABS No. D.C.-383"; National Park Service, "Wright-Patterson Air Force Base, Area B, Building 66, Central Heating Plant, HAER No. OH-79-AH"; National Park Service, "Roosevelt Central Heating Plant, HABS No. CA-2663-C"; National Register of Historic Places, Agricultural Heating Station, Madison, Dane County, Wisconsin; National Register of Historic Places, Heating Plant, Silver City, Grant County, New Mexico; Satterthwaite, "The Modern Power and Heating Plant at the University of Michigan."

<sup>43</sup> Satterthwaite, "The Modern Power and Heating Plant at the University of Michigan," 54.

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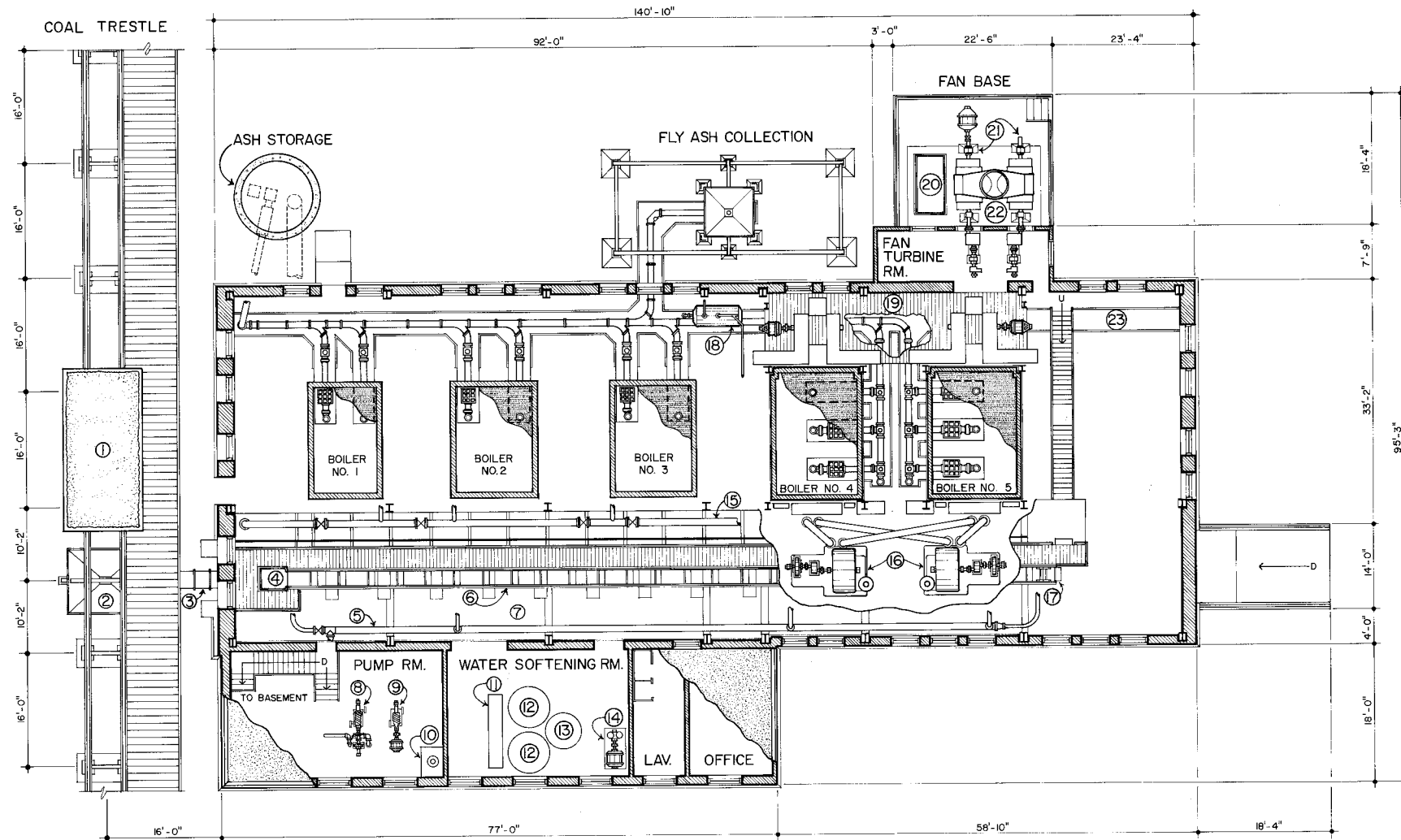
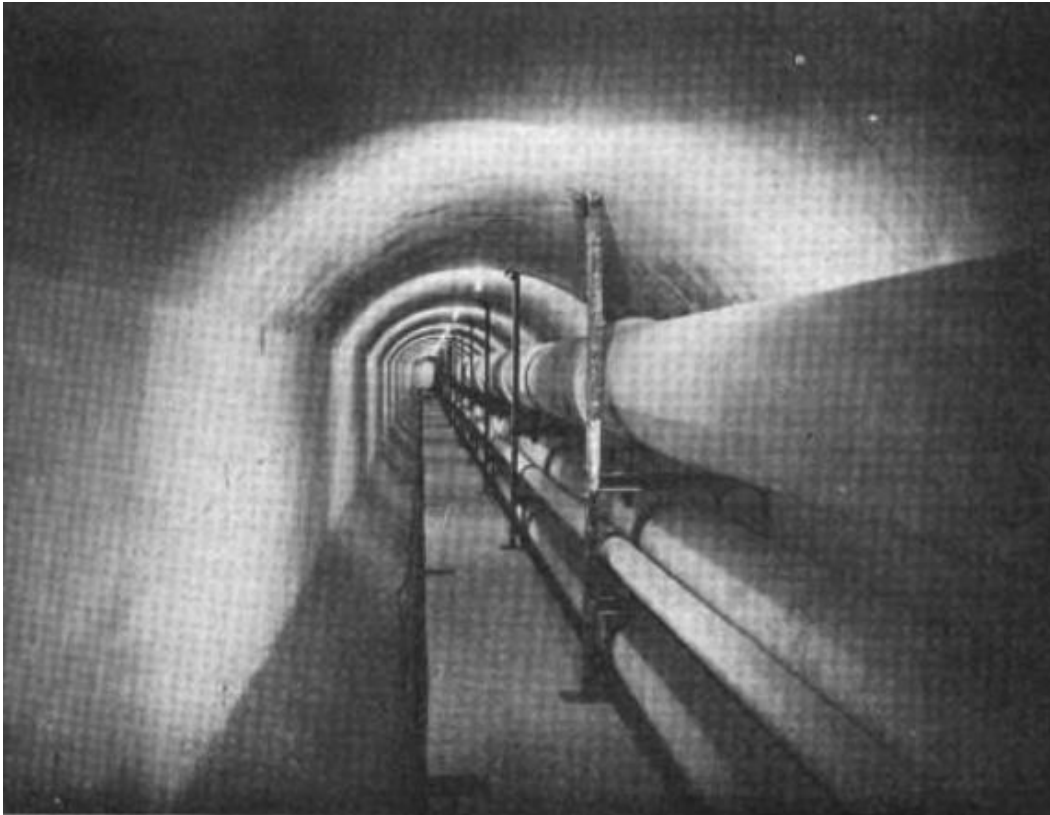


Figure 56. HAER floorplan of the 1929 Wright-Patterson Air Force Base Central Heating Plant showing large open spaces for boilers, pipes, and other equipment, and a single office and lavatory along the south side of the building.<sup>44</sup>

<sup>44</sup> National Park Service, "Wright-Patterson Air Force Base, Area B, Building 66, Central Heating Plant, HAER No. OH-79-AH."

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*Figure 57. View of the tunnel carrying steam and hot water from the University of Michigan's 1914 central heating plant.<sup>45</sup>*

As central plant designs evolved in the mid-twentieth century, they exhibited few major departures from earlier precedents. Examples of large central plants through the 1940s and 1950s continued to feature open floorplans with large spaces for equipment and separate administrative spaces; interiors were utilitarian and sometimes featured metal catwalks to access equipment (see Figure 58). Mid-century plants also conformed to the predominant architectural styles of the larger complex and sometimes exhibited individual architectural distinction. For example, the Central Heating Plant constructed at the Roosevelt Base in Los Angeles County, California, displayed the International style, which was characterized by rectilinear forms, lack of ornamentation, and use of modern materials such as exposed concrete (see Figure 59 and Figure 60).<sup>46</sup>

<sup>45</sup> Satterthwaite, "The Modern Power and Heating Plant at the University of Michigan," 53.

<sup>46</sup> National Park Service, "Roosevelt Central Heating Plant, HABS No. CA-2663-C."



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*Figure 58. Interior of the Roosevelt Base Central Heating Plant boiler room from a metal catwalk or platform.<sup>47</sup>*



*Figure 59. International-style Central Heating Plant completed in 1943 at Roosevelt Base in Los Angeles County, California.<sup>48</sup>*

<sup>47</sup> National Park Service, "Roosevelt Central Heating Plant, HABS No. CA-2663-C."

<sup>48</sup> National Park Service, "Roosevelt Central Heating Plant, HABS No. CA-2663-C."

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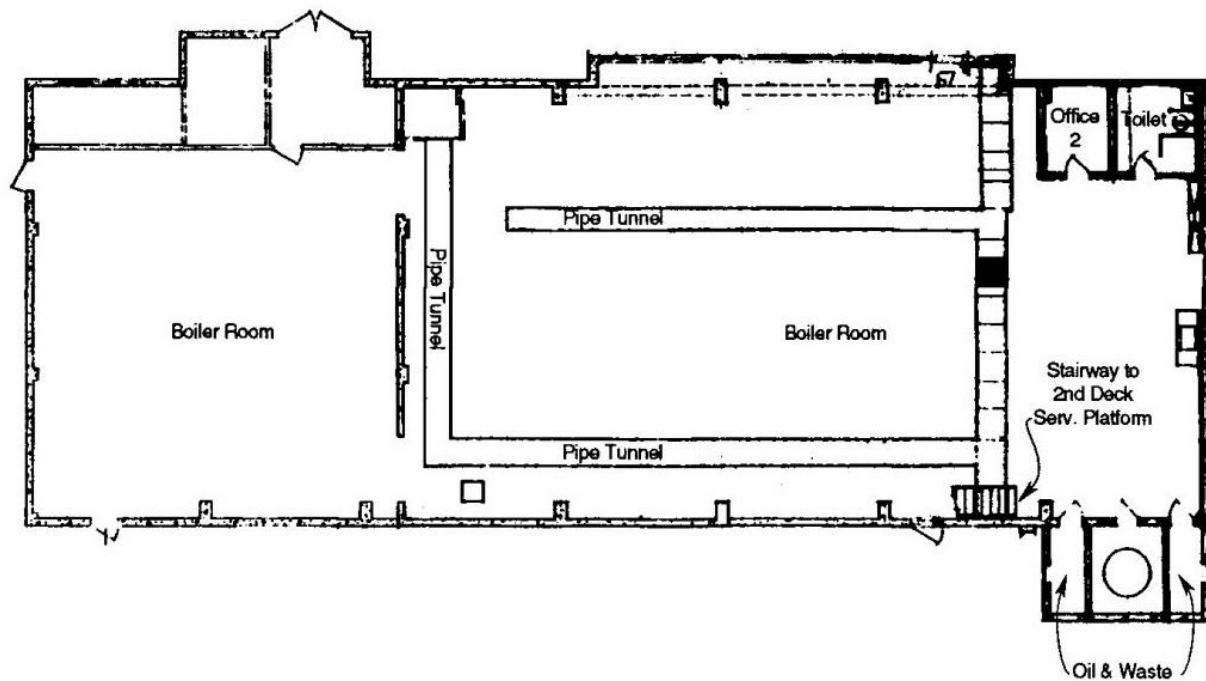


Figure 60. HABS floorplan of the Roosevelt Base Central Heating Plant showing large open spaces for boilers, pipes, and other equipment and a single office and bathroom in the northeast corner.<sup>49</sup>

By the mid-1950s air conditioning had become an expectation in public and commercial buildings, especially in warmer climates. Many large buildings were cooled using individual units, but the central plant concept was also applied in order to cool large multi-building complexes. New central plants constructed in the 1950s had both heating and cooling capabilities and some existing central heating plants were expanded to incorporate chillers and refrigeration equipment.<sup>50</sup> The Los Angeles County Central Heating and Refrigeration Plant constructed in 1958 provides an example of the combined heating and refrigeration plant concept. The plant exhibited modernist detailing including emphasized rectangular and repetitive vertical elements and exposed concrete exterior. The plant's architectural style complemented surrounding buildings and integrated steam heating and chilled water refrigeration systems to deliver both heat and air conditioning to over nine buildings within the county government complex (see Figure 61).<sup>51</sup>

<sup>49</sup> National Park Service, "Roosevelt Central Heating Plant, HABS No. CA-2663-C."

<sup>50</sup> As one example, the GSA followed their own guidelines and expanded the Central Heating Plant in Washington D. C. in 1957 on its east side to include refrigeration equipment. "Central Heating Plant, Washington D.C."

<sup>51</sup> "Many Outstanding Structures Designed by M.A. Nishkian Co.," *The Independent Press Telegram*, January 2, 1957; SWCA Environmental Consultants, *Built Environment Resources Technical Report, Regional Connector Transit Corridor Project, Los Angeles County California, Los Angeles Civic Center Historic District*, 2009, 16–17.

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Figure 61. Los Angeles County Central Heating and Refrigeration Plant constructed in 1958.<sup>52</sup>

#### (4) Airport central heating and air conditioning plants

As air traffic rapidly increased in the 1950s, airlines responded by expanding their facilities and services for travelers. Airports constructed larger terminals designed to operate 24/7 and began to routinely include lounges, restaurants, and retail stores in addition to baggage and ticketing areas. Both passenger and administrative interior spaces required year-round climate control in addition to hot water and steam for use in food service areas. These trends inevitably necessitated a need for larger and more sophisticated heating and air conditioning facilities.<sup>53</sup>

Writing in *Heating, Piping & Air Conditioning*, the Port Authority of New York's mechanical engineer Charles Broder promoted a central heating plant model using conventional centrifugal or absorption chillers and an HTW heating system to meet growing demands on airports. Both water-based heating and cooling mediums could be generated at the central plant and transmitted to buildings throughout the airport complex. HTW systems had been previously used abroad and for U.S. military installations but did not appear on civilian airports until 1957. Under Broder's direction, Idlewild Airport (now JFK) became the first civilian airport to construct a central plant with an HTW heating system. Idlewild's central plant included four HTW generators totaling 160 million BTU/hour and nine absorption chillers totaling 6,200 tons.<sup>54</sup> An article in the September 1961 issue of the *Architectural Record* claimed the plant was "the world's largest application of high temperature water as an energy source for both heating and absorption cooling."<sup>55</sup>

<sup>52</sup> *Los Angeles County Central Heating and Refrigeration Plant*, 1958, n.d., Los Angeles Examiner Photographs Collection, 1920-1961.

<sup>53</sup> Broder, "Heating & Air Conditioning a Civilian Airport," 147.

<sup>54</sup> Broder, "Heating & Air Conditioning a Civilian Airport," 151.

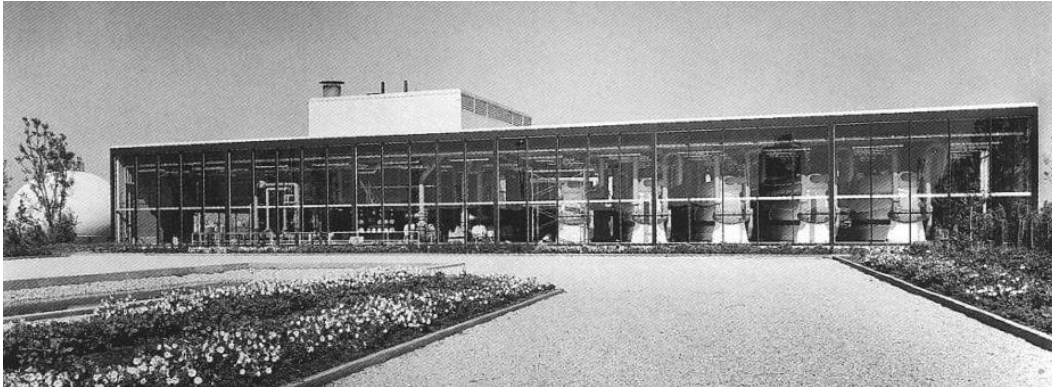
<sup>55</sup> "Idlewild: New York International Airport," *Architectural Record* 130 (September 1961): 186.



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Idlewild's Central Heating and Refrigeration Plant was a technological accomplishment, but not unlike university, government, or military central plants, it was also an architectural statement. Designed by the renowned Skidmore, Owings and Merrill architectural firm (SOM), the building's facade displayed a clean-lined steel-frame structure and glass window walls showcasing the mechanical systems and maze of multicolored pipes within (see Figure 62).<sup>56</sup>



*Figure 62. Central Heating and Refrigeration Plant constructed in 1957 at Idlewild Airport.*

Using Idlewild as the model example, Broder cited several benefits for establishing a central plant using HTW and chilled water. Benefits included the ability to redirect the hot water for domestic or industrial purposes, ability to eliminate or minimize the number of boiler flue pipes and stacks throughout passenger-occupied areas, and savings on overall construction and maintenance by centralizing operations in a single location.<sup>57</sup> Airport buildings could be grouped and arranged into patterns adaptable for the centralized heating and air conditioning model. According to Broder, the size of the plant required, overall length and size requirements for transmission lines, and construction costs were all factors airport planners should consider.<sup>58</sup> Other airports began utilizing the technology by the early 1960s. By 1962 both Los Angeles International Airport (LAX) and O'Hare had designed and completed centralized heating and refrigeration plants using HTW heating systems.<sup>59</sup>

### C. History of the O'Hare H&R Plant

#### (1) Design and construction of the H&R Plant

In 1955 Mayor Richard Daley commissioned the architectural firm Naess & Murphy, renamed C.F. Murphy Associates (C.F. Murphy) in 1960, to review Burke's original plan and build upon it with larger terminals and greater automobile access. C.F. Murphy partnered with the Cincinnati-based firm Landrum & Brown to complete the new airport design.

<sup>56</sup> "Idlewild: New York International Airport," 186.

<sup>57</sup> Broder, "Heating & Air Conditioning a Civilian Airport," 147–48.

<sup>58</sup> Broder, "Heating & Air Conditioning a Civilian Airport," 147–49.

<sup>59</sup> "\$2.8 Million Plant Regulates Temperatures at Jet Terminal," *The Los Angeles Times*, February 11, 1962, [https://www.newspapers.com/clip/35368429/28\\_million\\_plant\\_regulates/](https://www.newspapers.com/clip/35368429/28_million_plant_regulates/).

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The initial report, submitted in 1958 and entitled *Chicago-O'Hare International Airport: Engineering Report, First Stage Development Program*, outlined the proposed expansions to the airport. It included descriptions of the types of new facilities, outline specifications, and cost estimates. Along with the terminals and hangars, the report included plans for service-oriented facilities including a fire station, maintenance buildings, cargo areas, fuel tanks, and “a large new heating and refrigeration plant.”<sup>60</sup> The primary function of the new central plant, located adjacent to the terminal area near the main entrance road, was to provide heat and air conditioning services to the airport's terminals, concourses, and restaurant building. Initial estimates for its construction cost exceeded \$4.5 million.<sup>61</sup> The building's preliminary outline specifications called for a one-story, 25,000-square-foot building with a steel-frame structure on a concrete foundation. Interior spaces would have concrete floors, concrete-block walls, and exposed ceilings, and a partial basement would connect to the reinforced-concrete utility tunnel system. Drawings included in the report show a glass and steel building reminiscent of Idlewild's Central Heating and Cooling Plant completed in 1957. Like Idlewild, O'Hare's plant featured a largely glass exterior allowing passersby from the outside a full display of its complex mechanical equipment (see Figure 63).<sup>62</sup>

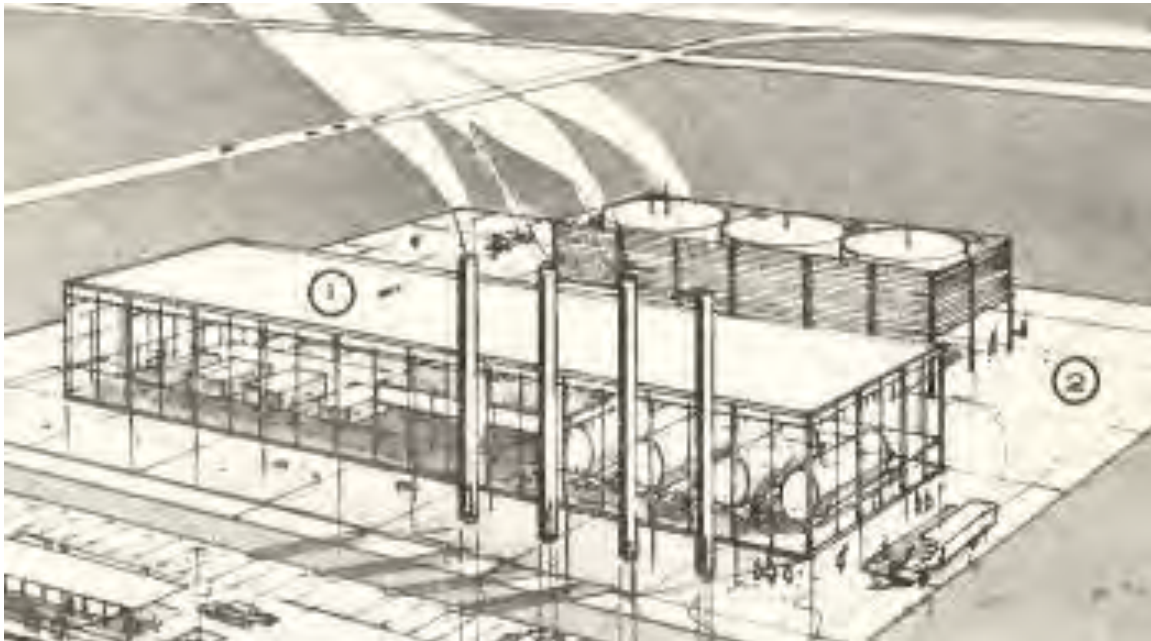


Figure 63. Artist's drawing of the proposed H&R Plant (item 1) showing a glass exterior with an open interior floorplan and cooling tower (item 2) to the east.<sup>63</sup>

<sup>60</sup> The report used “refrigeration” and “air conditioning” interchangeably, when referring to the plant's cooling systems. The outline specification section refers to the building as the “New Heating and Air Conditioning Plant.”

<sup>61</sup> Naess & Murphy, Landrum & Brown, and James P. O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program* (Prepared for the City of Chicago, 1958), 11, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/chicagoohareinte00odon>, Northwestern University Transportation Library.

<sup>62</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 22–24.

<sup>63</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 22–24.

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The groundbreaking for the airport's expansion program took place in 1959.<sup>64</sup> By October 1960 Naess & Murphy announced that an additional \$35 million would be needed to complete expansions at O'Hare. Due to the rapid growth of commercial aviation and inaccurate estimates during preliminary planning, engineering changes were needed for multiple buildings including the terminals and the H&R Plant. Cost estimates for the H&R Plant rose from \$4.5 million to \$7.5 million.<sup>65</sup> Expansions to the plant's design included additional heating and cooling equipment, larger pipes for distribution at higher capacities, and a centralized control system, which Naess & Murphy argued would "more than pay for itself in future operational and maintenance savings." The building's footprint would also need to be expanded to accommodate the additional equipment.<sup>66</sup> The Chicago City Council approved the sale of revenue bonds in the amount of \$35 million to pay for additional airport expansion costs by February 1961.<sup>67</sup>

Construction plans for the H&R Plant had already been approved before the announcement of additional bond sales. Design drawings for the plant's structural concrete such as boring for pipes and plumbing, as well as construction of the foundation, basement, and a connection to the airport's larger hexagon-shaped utility tunnel were approved by November 1960 and completed by November 1961. Plans for the building's steel structural system were approved in December 1960 and designs for the remaining contract, which included architecture, structural, mechanical, and electrical, were approved February 1961.<sup>68</sup> Plans also included the original cooling tower located east of the main H&R Building. The tower rested on a concrete foundation and had a wood and aluminum frame structure with horizontal redwood slats for ventilation on all elevations.<sup>69</sup> Original mechanical and architectural drawings show that the plant's designers anticipated future growth. The site plan designated areas of approximately 2,500 square feet at the north and south ends of the building for future expansions.<sup>70</sup>

Naess & Murphy selected Stanislaw Z. Gladych as the chief designer for the project with Carter Manny, Jr. as the project manager.<sup>71</sup> Sherwin Asrow, a young engineer with the firm, was in charge of structural engineering under the direction of John Roch.<sup>72</sup> Despite expansions, the plant's final exterior design

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<sup>64</sup> George S. DeMent, "Chicago's O'Hare International Airport," *The American Public Works Association (APWA) Reporter* 29–30 (1962): 2, 12.

<sup>65</sup> Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)*, 232.

<sup>66</sup> Naess & Murphy, *Interim Report, Construction Costs for the O'Hare Revenue Bond First Stage Development Program* (Chicago, Ill, 1960), 36, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport, Northwestern University Transportation Library.

<sup>67</sup> Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)*, 238.

<sup>68</sup> Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant FDTNS, Building No. 11, Contract No. RB 32, Chicago O'Hare International Airport," November 1961, Available in the Chicago Department of Aviation files, Chicago; Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant, Structural Steel - Building No. 11, Contract No. RB 39, Chicago O'Hare International Airport," March 1962, Available in the Chicago Department of Aviation files, Chicago.

<sup>69</sup> Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant, Architectural, Structural, Mechanical, Electrical, Contract No. RB 35, Chicago O'Hare International Airport," July 1964, A26–27, Available in the Chicago Department of Aviation files, Chicago.

<sup>70</sup> Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant FDTNS, Building No. 11, Contract No. RB 32, Chicago O'Hare International Airport," C1.

<sup>71</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals," *Chicago Tribune*, January 4, 1982.

<sup>72</sup> Franz Schulze, *Oral History of Carty Manny* (Chicago: Art Institute of Chicago, 1995), 207, 210.



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closely resembled the drawing and preliminary outline specifications provided in the 1958 report. However, while the drawing shows large plates of clear glass between thin mullions or columns, the actual design had square glass panels placed between wide protruding H-shaped columns and large steel mullions along all elevations.<sup>73</sup> Manny, Jr. later recounted that Gladych initially envisioned thinner mullions to create a much more slender design resembling Ludwig Mies van der Rohe's Crown Hall at the Illinois Institute of Technology. According to Manny, project engineer Sherwin Asrow favored the larger mullions to prevent buckling and disputed Gladych's original design. Ultimately Gladych conceded to Asrow's recommendations.<sup>74</sup> Even with its large steel mullions and wide H-shaped columns, the resulting building design clearly reflected the firm's commitment to Miesian principles, which were grounded in modernism and characterized by streamlined rectilinear designs and honest use of building materials (discussed further below). The H&R Building's clean lines and expansive glass curtain wall exterior closely matched the aesthetic of both Terminals 2 and 3 (see Figure 64). By the summer of 1962 the new plant was completed and in operation to service the airport buildings.<sup>75</sup>



*Figure 64. The H&R Building west facade shortly after completion. Photograph credit: HB-25500-W, Chicago History, Museum, Hedrich-Blessing, Collection, © 2019 Chicago Historical Society, all rights reserved.*

<sup>73</sup> Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant FDTNS, Building No. 11, Contract No. RB 32, Chicago O'Hare International Airport"; Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant, Structural Steel - Building No. 11, Contract No. RB 39, Chicago O'Hare International Airport"; Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant, Architectural, Structural, Mechanical, Electrical, Contract No. RB 35, Chicago O'Hare International Airport."

<sup>74</sup> Schulze, *Oral History of Carty Manny*, 210.

<sup>75</sup> C.F. Murphy Associates, *Chicago O'Hare International Airport: Revenue Bond Improvement Program* (Chicago, Ill, 1962), 1–2, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport, Northwestern University Transportation Library.

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#### (2) Opening and operation of the H&R Plant

The sleek modern design of the H&R Building received praise before and after its completion in 1962. According to Carter Manny, Jr, after its completion, the H&R Building brought C.F. Murphy Associates “a lot of favorable comment.”<sup>76</sup> Writing in the *American Public Works Association Reporter*, Chicago Department of Public Works official George Dement commented on the plant’s “impressive” appearance at night (see Figure 65): “Through the exterior glass curtain walls will be seen a well-lighted interior with a multicolored pattern of boilers, refrigeration machines, and a complete system of piping.”<sup>77</sup> Another article noted that the building looked like a replica of the terminal buildings.<sup>78</sup> Writing over 10 years after its completion, architectural historian Carl Condit called the building “the handsomest building in the whole vast complex.”<sup>79</sup>



Figure 65. Nighttime view of the H&R Building's east (rear) elevation showing a clear view of the interior from the outside.<sup>80</sup>

In addition to the building's notable exterior design, its mechanical equipment and the expansive system of pipes and tunnels that connected the plant to airport buildings received equal if not more media attention.<sup>81</sup> The H&R Building contained four 50 million BTU/hour HTW generators, three 2,000-ton Carrier hermetic centrifugal chillers, and various pumps, pipes, and control equipment. The machines were painted white and pipes were color-coded in several pastel colors to differentiate their function and contents (see Figure 66 and Figure 67).<sup>82</sup> These machines delivered high-temperature (400°F) and chilled (42°F) water through large pipes in the utility tunnel to airport buildings for heating and air

<sup>76</sup> Schulze, *Oral History of Carty Manny*, 210.

<sup>77</sup> DeMent, “Chicago’s O’Hare International Airport,” 14.

<sup>78</sup> Howard James, “Miles of Pipe Keep Airport Warm, Cool,” *Chicago Sunday Tribune*, January 28, 1962, sec. 1.

<sup>79</sup> Carl W. Condit, *Chicago: 1930-70: Building, Planning, and Urban Technology* (Chicago and London: The University of Chicago Press, 1974), 262.

<sup>80</sup> Mark J. Bouman, “Cities of the Plane: Airports in the Networked City,” in *Building for Air Travel: Architecture and Design for Commercial Aviation*, ed. John Zukowsky (Chicago: Art Institute of Chicago, 1996), 190.

<sup>81</sup> American Institute of Architects et al., *AIA Guide to Chicago* (San Diego, New York and London: Harcourt Brace, 1993), 266.

<sup>82</sup> James, “Miles of Pipe Keep Airport Warm, Cool,” 8.

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conditioning systems. The plant was designed to keep the terminal buildings at least 70°F during the winter and no higher than 78°F during summer months.<sup>83</sup> Newspaper articles noted the impressive size and complexity of the plant's heating and refrigeration systems, and devoted considerable attention to the plant's HTW heating system in particular. The plant was touted as "one of the largest and most modern heating and cooling plants in the Midwest" and its heating system was noted as one of the "few of its kind in the country."<sup>84</sup>

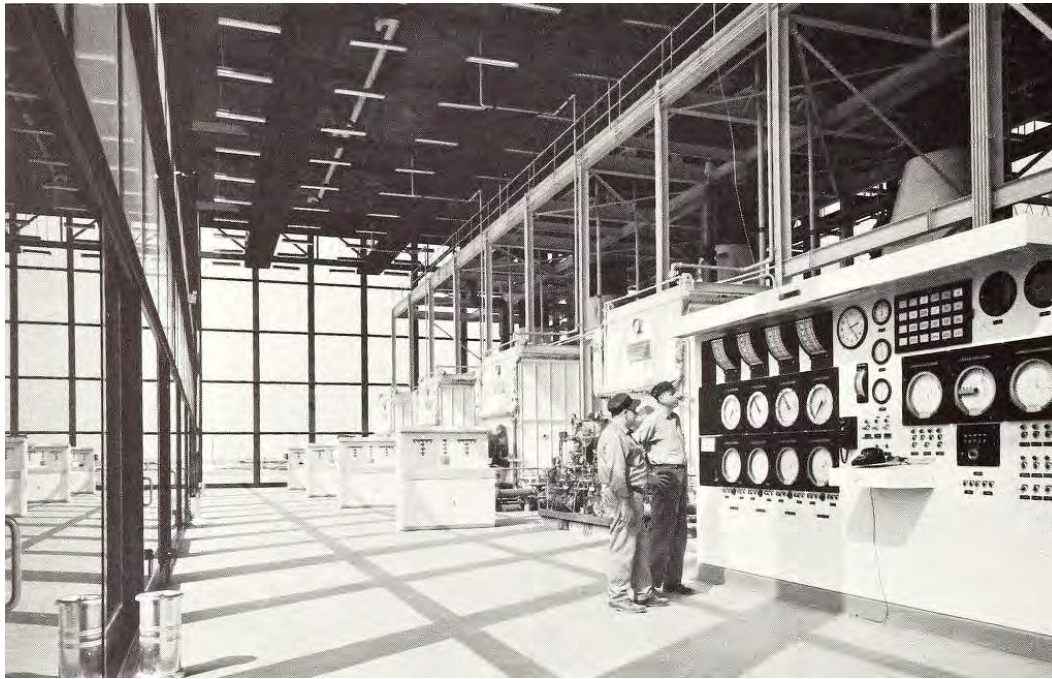


Figure 66. Interior view of the H&R Building showing control equipment and four HTW generators, 1962.<sup>85</sup>

<sup>83</sup> "A View from Beneath the Field," *Chicago Tribune*, March 24, 1963, sec. Chicago Sunday Tribune Magazine, 20.

<sup>84</sup> James, "Miles of Pipe Keep Airport Warm, Cool," 8; "A View from Beneath the Field," 20.

<sup>85</sup> C.F. Murphy Associates, *Chicago O'Hare International Airport: Revenue Bond Improvement Program*, 4.



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*Figure 67. Interior view of the H&R Building showing three Carrier hermetic centrifugal chillers painted white, 1962.<sup>86</sup>*

The 1958 preliminary outline specifications called for a steam-based heating system, but instead O'Hare's designers chose to use an HTW system, which had only been used by a few other major airports at that time including Idlewild and LAX. The O'Hare H&R Plant's HTW generators heated water to over 400°F and pumped it through pipes within the airport's utility tunnel system at pressures of up to 408 psi. These high pressures allowed the water to remain liquid despite temperatures well above the boiling point. The H&R Plant pumped the high-temperature water through the tunnels to the basement levels of the terminals and then up to penthouses located on top of the terminals. Here various heat exchangers and blowers processed and distributed the water to create radiant heat, forced warm air, and domestic hot water in the buildings.<sup>87</sup> The overall system was considered highly efficient as the pressurized water could be circulated throughout the airport complex and return to the central plant without substantial losses of energy.<sup>88</sup>

The central H&R Plant was an integral part of the airport design. The central plant model and HTW system also allowed the airport's architects freedom to design the terminals without the visual obstruction of radiators or boilers, which were typically necessary for decentralized heating systems. Naess & Murphy's head of mechanical and electrical engineering, Robert Salinger, worked with manufacturers to create custom heat-radiating metal acoustical ceiling panels for the terminal buildings that would be ideal for the HTW system.<sup>89</sup>

<sup>86</sup> C.F. Murphy Associates, *Chicago O'Hare International Airport: Revenue Bond Improvement Program*, 4.

<sup>87</sup> DeMent, "Chicago's O'Hare International Airport," 14.

<sup>88</sup> Schulze, *Oral History of Carty Manny*, 208–10.

<sup>89</sup> Schulze, *Oral History of Carty Manny*, 208–9.

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During its first few years of existence, the plant's operating engineers contended with frequent leaking issues. High-pressure HTW systems had been developed and used in Europe decades earlier but were still uncommon in the United States in the early 1960s. As a result, manufacturers had not yet fully developed or tested valves and other components that could withstand such high pressures without leaking.<sup>90</sup> Operating engineers experienced numerous problems with leaking throughout the HTW system. One article described the plant as a "pipe fitters' nightmare" and another defined leaks in the heating system as the chief operating engineer's "hated enemy."<sup>91</sup> A major source of leaking were expansion joints placed along pipes at intervals in the system. Manny, Jr. later recounted that the designers chose expansion joints rather than loops, or sections of extra pipe, to absorb expansions due to changes in temperature or pressure. Expansion joints saved space but were closely packed in some areas to the point where they tore and leaked.<sup>92</sup> The system required constant maintenance and visual inspection to detect small leaks before they became major issues.<sup>93</sup>

### (3) Expansion and alteration of the H&R Plant

Air traffic in the United States continued to increase rapidly through the 1960 and 1970s, placing continued pressure on airports around the country. Between 1966 and 1971 airline passenger traffic increased by a rate of 179 percent. By the end of the 1960s facilities at many large airports required expansion and updates. With this growth came increasing demand for improved and expanded service facilities. For example, by 1971 JFK (formerly Idlewild) had updated its Central Heating and Cooling Plant with additional high-capacity HTW generators and chillers.<sup>94</sup>

Airlines at O'Hare responded to increasing demand and overcrowding by infilling nose pocket areas along the concourses to create additional hold room space. The early 1970s also saw the completion of the C.F. Murphy-designed O'Hare Hilton Hotel, parking garage, and a new control tower.<sup>95</sup> Additional buildings and expansions throughout the airport placed increasing demands on the H&R Plant, which required new equipment and building additions by the early 1970s. In October 1972 plans were approved for an additional chiller and a major addition on the north elevation of the H&R Plant. The north addition was approximately 17,420 square feet, far exceeding the building's original design intent for future expansions of 2,500 square feet on each end of the building. The north expansion, referred to by the CDA as the north addition, was completed by 1974, and a second cooling tower was constructed east of the addition to accommodate the new chiller. C.F. Murphy worked with engineering firm John Dolio & Associates to design the north addition and install the first additional chiller. The exterior design of the north addition incorporated the exposed structural steel and glass curtain wall of the original building and created an integrated and cohesive overall exterior. A glass partition with glass doors on the ground floor

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<sup>90</sup> Schulze, *Oral History of Carty Manny*, 209.

<sup>91</sup> James, "Miles of Pipe Keep Airport Warm, Cool," 8; "A View from Beneath the Field," 20.

<sup>92</sup> Schulze, *Oral History of Carty Manny*, 208–10.

<sup>93</sup> "A View from Beneath the Field," 20.

<sup>94</sup> William F. Heavey, Jr., "Airports Face New Energy Demands," *ASHRAE Journal*, September 1971, 73.

<sup>95</sup> The hotel was originally named the O'Hare International Tower Hotel but was changed to the O'Hare Hilton Hotel in 1974.

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separated the north addition from the original building to the south.<sup>96</sup> The expansion allowed room for additional equipment including more chillers and HTW generators added in the late 1970s.

A trend toward deregulation beginning with the Airline Deregulation Act in 1978 wrought the next major change in air traffic and airport design. Airlines began to centralize their operations into “hubs” in order to maximize profits and efficiency. As a result, larger regional and international airports saw increased passenger numbers. In 1980 United Airlines began the planning process for a new terminal to support Chicago as one of its major hubs.<sup>97</sup> Two years later the CDA launched the ODP to expand O'Hare's capacity. O'Hare underwent numerous expansions during this period as a result of the ODP, including the construction of the new Terminal 1 designed by Murphy/Jahn (formerly C.F. Murphy), addition of Concourse L, and expansion of Terminal 3.<sup>98</sup>

The ODP also included major expansions to the H&R Plant in order to meet the demands of the new facilities. Expansions under the ODP were led by O'Hare Associates, a joint venture of multiple firms led by Murphy/Jahn. Fluor Engineering and Globetrotters Engineering Corporation completed architectural, structural, mechanical, and electrical designs for the H&R Plant expansion. The expansion included a major addition along the entire length of the building's west elevation that became the west addition, completed by 1987.<sup>99</sup> This was not one of the areas intended for expansion shown on the building's original design plans. The new west elevation was essentially a reconstruction of the building's original Miesian facade using a combination of reused and new materials. The large H-shaped columns that had protruded from the original west elevation were left in place to provide structural support and designate a new central north-south access aisle inside the building. The building's central administrative core, including ground level, mezzanine, and second mezzanine level, was essentially duplicated within the west addition. The west addition housed additional equipment added in the 1980s and 1990s, including chillers, HTW generators, various pumps, and upgraded control equipment. A third cooling tower and two substations were also constructed in order to control voltage and electricity distribution. Both substations were one-story, rectangular-plan, flat-roof buildings with metal-frame, exterior window walls. The RB 40 Substation building was completed in October 1984 northeast of the main H&R Building between the north cooling tower and the Kennedy Expressway and included the relocation of existing substation

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<sup>96</sup> C.F. Murphy Associates and John Dolio & Associates, “As-Built Plans for Expansion of Heating and Refrigeration Plant, General Construction and 1st Additional Chiller Unit, Chicago O'Hare International Airport,” February 1977, Available in the Chicago Department of Aviation files, Chicago; Chicago Department of Aviation, *Heating and Refrigeration Plant: O'Hare International Airport*, 3.

<sup>97</sup> Brodherson, “All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis,” 92.

<sup>98</sup> “The Fascinating History of Chicago's O'Hare International Airport 1920-1960”; Robert Davis, “United Plans \$100 Million New Terminal at O'Hare,” *Chicago Tribune*, September 20, 1980; David Young, “United Plans New O'Hare Terminal,” *Chicago Tribune*, December 10, 1982; John Camper, “O'Hare Project Picks up: Expansion Enters Peak Year of Construction,” *Chicago Tribune*, March 1, 1987; O'Hare Associates, “Progress Report, Chicago-O'Hare International Airport Development Program, June 1984,” 1; Washburn, “World at City's Doorstep as New O'Hare International Terminal Takes Wing.”

<sup>99</sup> CDA history of the H&R plant states that the H&R west addition was constructed in 1986-1987, see Chicago Department of Aviation, *Heating and Refrigeration Plant: O'Hare International Airport* (Chicago: Chicago Department of Aviation, c 1998), 4; The H&R Plant expansion under ODP number 701 was 88 percent complete by October 1987. See Chicago Department of Aviation; O'Hare Associates, *Progress Report, Chicago-O'Hare International Airport Development Program, October 1987* (Chicago, October 1987).

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equipment that had been south of the O'Hare Telephone Building.<sup>100</sup> The City Substation was completed in 1987 and is located immediately west of the O'Hare Telephone Building's associated garage.<sup>101</sup>

The H&R Plant underwent additional changes and additions in the 1990s and early 2000s. In 1994 the original wood cooling tower was demolished and replaced with an 8,000-ton expandable cooling tower.<sup>102</sup> By 2006 the 1974 cooling tower was demolished and replaced with the current North Cooling Tower, and by 2014 the 1987 cooling tower was demolished and replaced with current East Cooling Tower.<sup>103</sup> The plant's equipment has also been modified and replaced over the years. Recent replacements include several of the original chillers and HTW generators.<sup>104</sup> The H&R Building has had few notable alterations since the west addition was completed in 1987. However, continuous minor modifications have been made within the building's administrative spaces and a number of exterior windows have been replaced in kind after being damaged.

#### (4) Naess & Murphy/C.F. Murphy Associates

The design for the expansion of O'Hare, including the H&R Plant, was led by the architectural firm of Naess & Murphy in the late 1950s and early 1960s. A brief history of the firm is provided as context for understanding how the design fits into the firm's role in Chicago modern architecture in the mid-twentieth century.

The architectural firm of Naess & Murphy, later known as C.F. Murphy Associates, Murphy/Jahn, and JAHN, represents one of the largest and most prolific architectural firms in post-World War II (postwar) Chicago. The firm represents a "lineage" of Chicago architects, beginning with Daniel Burnham in the nineteenth century, and emerged during a pivotal time in the history of Chicago and its urban development. The works of Naess & Murphy/C.F. Murphy marked a transition in the city from 1930s

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<sup>100</sup> Design plans and a review of historic aerial imagery indicate that the existing RB 40 substation equipment located southwest of the O'Hare Telephone Building was not located within a building. See O'Hare Associates, *Progress Report, Chicago-O'Hare International Airport Development Program, December 1985* (Chicago, December 1985), 92; O'Hare Associates, "As-Built Plans for RB-40 Substation Relocation, Chicago O'Hare International Airport Development Program, City of Chicago," January 1990, Available in the Chicago Department of Aviation files, Chicago, Ill.

<sup>101</sup> The City Substation was completed under ODP 710 (Heating & Refrigeration Plant Expansion). ODP progress reports and CDA history of the H&R plant indicate the project was completed between by 1987. Chicago Department of Aviation, *Heating and Refrigeration Plant: O'Hare International Airport*; Fluor Engineers, Inc and Globetrotters Engineering Corporation, "As-Built Plans for H & R Plant Building Expansion, General Construction and 1st Additional Chiller Unit, Chicago O'Hare International Airport," January 1990, Available in the Chicago Department of Aviation files, Chicago, Ill.; O'Hare Associates, *Progress Report, Chicago-O'Hare International Airport Development Program, October 1987*.

<sup>102</sup> Chicago Department of Aviation, *Heating and Refrigeration Plant: O'Hare International Airport*, 4.

<sup>103</sup> Burns & McDonnell, "East Cooling Tower Replacement," *Burns & McDonnell*, n.d., <https://www.burnsmcd.com/projects/east-cooling-tower-replacement>.

<sup>104</sup> Intelligent Design & Construction Solutions, LLC, "Upgrade of the Chillers and South Cooling Tower (O'Hare)," *Intelligent Design & Construction Solutions, LLC*, n.d., <http://www.idcs-llc.com/index.cfm/projects/projectfolder/upgrade-of-the-chillers-and-south-cooling-tower-ohare/>; Epstein, "Installation Begins on O'Hare's New High Temperature Water Generator," *Epstein*, April 2, 2019, <https://www.epsteinglobal.com/whats-new/2018/installation-begins-on-ohares-new-high-temperature-system>.



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modernist architecture to the International style of the Second Chicago School of Architecture, which was heavily influenced by the work of Ludwig Mies van der Rohe (commonly referred to as Mies). Co-founder Charles F. Murphy, Sr. managed the firm and hired multiple architect and designers for various commissions. In the 1950s, the firm developed a relationship with Mayor Richard Daley early in his mayoral career and worked on highly visible projects at O'Hare and the Downtown Loop, intended by Daley to promote Chicago as a modern city. This context addresses the background of Charles F. Murphy, his professional relationship with Mayor Daley, and the firm's shift towards the Second Chicago School. A brief summary of the firm following its acquisition by Helmut Jahn in the 1980s is also provided for context of the firm's work at O'Hare.

Charles F. Murphy, Sr. was born in New Jersey in 1890 and moved to Chicago during his childhood. He graduated from the De La Salle Institute, a Catholic technical high school in Chicago, where he was trained as a stenographer. Murphy entered the architectural field in 1911 as secretary for the firm of Daniel Burnham, one of Chicago's leading architects. While working at D.H. Burnham and Company, Murphy became the personal assistant to Ernest Graham, an architect working at the firm. The two maintained a very close working relationship for the next 25 years, with Murphy following Graham to the firm of Graham, Anderson, Probst, and White in 1917.<sup>105</sup> Graham's new firm was one of the most prolific in Chicago, with significant works including the Pittsfield Building (1927), the Straus Building (1923-1924), the Foreman State Bank (1928-1930), and the Field Building (1934). Murphy became a licensed architect while working with Graham, but mostly managed the inner workings of the firm and developed the managerial and administrative skills that he would employ for the remainder of his career.<sup>106</sup>

Ernest Graham passed away in 1936. The day after Graham's death, Murphy was fired from the firm along with two other architects: Sigurd Naess and Alfred Shaw. These three architects soon opened their own firm, Shaw, Naess, and Murphy. Continuing his role as an administrator, Murphy developed the strong corporate organization that would come to define the firm. Sigurd Naess had emigrated to the United States from Norway as a young man in 1902. He became known as a planning expert, and led much of the production work at Shaw, Naess, and Murphy. Alfred Shaw was a designer and painter from Boston who studied at MIT before working in Chicago. Shaw was the first of many designers that Murphy relied on over the years to build the firm's reputation. With the Great Depression followed by World War II, the 1930s and 1940s proved to be a difficult time for most architectural firms, especially one starting out. During this time, Shaw, Naess, and Murphy found work on smaller projects including a remodel of the Museum of Science and Industry in Chicago, designing and installing elevators and escalators in the Marshall Field store, and designing a munitions plant in New Jersey. The firm also gained experience in the aviation field during the war, completing work at Bunker Hill Field (currently Grissom Air Reserve

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<sup>105</sup> Kenan Heise, "Charles F. Murphy, Chicago Architect," *Chicagotribune.Com*, accessed July 22, 2019, <https://www.chicagotribune.com/news/ct-xpm-1985-05-24-8502020167-story.html>; Franz Schulze, *Oral History of Carty Manny* (Chicago, Ill.: Art Institute of Chicago, 1995), 108; Mark J. Bouman and John Zukowsky, Ed., *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: Prestel and The Art Institute of Chicago, 1993), 468.

<sup>106</sup> Ross Miller, "Helmut Jahn and the Line of Succession," in *Chicago Architecture and Design 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: The Art Institute of Chicago and Perstel-Verlog, 1993), 305; Schulze, *Oral History of Carty Manny*, 108; Carol Willis, "Light, Height, and Site: The Skyscraper in Chicago," in *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis*, 1993, 131.

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Base) in Indiana and Kindley Air Force Base in Bermuda (now Bermuda International Airport). Due to personal conflicts, among other factors, Alfred Shaw left the firm in 1946 and the firm's name changed to Naess & Murphy.<sup>107</sup>

The first major project for Naess & Murphy was the Prudential Insurance Building (1952-1955), the first skyscraper built in Chicago since the Field Building in 1934. The 44-story concrete and glass building not only signaled the return of skyscraper construction to Chicago, but also signified the arrival of postwar modernism to the urban landscape. Kenan Heise, writing for the *Chicago Tribune* in 1985, argued that the Prudential Building “hinged two eras of Chicago architecture,” and that it “opened the modern, explosive era of Chicago commercial architecture.”<sup>108</sup> Naess & Murphy continued to work on other commercial projects in the 1950s, including the Chicago Sun-Times Building (1957) and the Federal Reserve Addition (1957), which historian Ross Miller has described as “serviceable modernism.” However, the Prudential Building proved to be the firm's most significant building of the 1950s, not only for its architectural significance, but also because it was at the dedication in 1954 that Murphy met the soon-to-be-mayor Richard J. Daley. The relationship that developed between Murphy and Daley would establish Naess & Murphy as one of the leading architectural firms in Chicago.<sup>109</sup>

After their first meeting, Mayor Daley and Murphy slowly developed a professional relationship that extended through the 1960s. Daley had a vision to rebuild the downtown Chicago Loop as a modern American city, and Murphy's firm became an integral partner in bringing that vision to reality. Murphy and Daley shared an Irish-Catholic connection, and they had both attended the De La Salle Institute, although Daley graduated from the school decades after Murphy. According to Miller, Daley was impressed with Murphy because he “did not strike Daley as a fancy-pants architect.”<sup>110</sup> Daley soon turned to Murphy to help him prevent a lawsuit from residents along the South Shore attempting to stop the construction of a new water filtration plant. Naess & Murphy worked to make the plant more attractive by designing a civic park as part of the facility and saved the new mayor from the impending lawsuit. Daley then turned to Naess & Murphy to help him with another difficult situation with the city's new airport at O'Hare Field.<sup>111</sup>

When Daley took office, funding for O'Hare had been a point of contention between the City and the airlines for nearly a decade. However, the new mayor was committed to building a modern airport for Chicago and he soon began direct negotiations with the airlines to reach a mutual agreement in 1956. With funding secured, he commissioned Naess & Murphy to review the plans drafted by Ralph Burke, and construction began in earnest in 1959. Between 1960 and the mid-1970s, the firm (including its successors) was responsible, along with multiple partner firms, for the design and construction of O'Hare, including Terminals 2 and 3, the Rotunda, the Heating & Refrigeration Plant, the O'Hare Telephone Building, and the O'Hare Hilton Hotel. The firm was also involved in designing the overall layout of the airport, including the runways, roadways, parking structures, and various other utilitarian buildings and

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<sup>107</sup> Miller, “Helmut Jahn and the Line of Succession,” 305; Schulze, *Oral History of Carty Manny*, 110–11, 152.

<sup>108</sup> Heise, “Charles F. Murphy, Chicago Architect.”

<sup>109</sup> Miller, “Helmut Jahn and the Line of Succession,” 303, 305.

<sup>110</sup> Miller, “Helmut Jahn and the Line of Succession,” 303.

<sup>111</sup> Schulze, *Oral History of Carty Manny*, 152.

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systems.<sup>112</sup> C.F. Murphy Associates was honored in 1963 by the Chicago Association of Consulting Engineers for the design of the terminal buildings and the Rotunda.<sup>113</sup> An August 1963 issue of *Progressive Architecture* outlined the design of the new O'Hare plan, stating that it "lacks the brilliance and originality of Dulles" but shows strength in details such as "the meticulous care with which the individual buildings were designed; in the expert integration of structural and mechanical services; in the orderly and craftsman-like execution of the interiors, which have visual harmony in spite of the diverse requirements of 13 different airlines; and in the well-designed adjunct service structures, such as the fire station, the heating and refrigeration plant, and the central telephone exchange..."<sup>114</sup>

Sigurd Naess retired in 1959 and Murphy subsequently changed the name of the firm to C.F. Murphy Associates (C.F. Murphy) in 1960. Murphy's son, Charles F. Murphy, Jr., became more involved in the firm. Murphy, Jr. was an admirer of Mies and began hiring designers and architects, many of whom are now associated with the Second Chicago School of Architecture, who had either been trained by Mies or were committed to following his philosophies embodied in the International Style. The first of these new architects was Stanislaw Gladych, previously employed by SOM, who was hired as the firm's lead designer. Gladych was one of the leading architects at O'Hare along with Carty Manny, Jr., Gertrude Lempp Kerbis, and John Novack, all of whom were strongly influenced by Mies. Other notable architects employed by C.F. Murphy throughout the 1960s included Otto Stark, Jacque Brownson, and James Ferris. C.F. Murphy's turn toward International-style design also fit perfectly into Mayor Daley's vision to modernize Chicago. According to Ross Miller, "The radically modern architecture demonstrated that the mayor of Chicago was not simply defending old arrangements but was doing nothing less than recasting the aging American downtown."<sup>115</sup> Connecting Chicago to the world with a modern airport facility at O'Hare was an early priority for Daley and his vision to rebuild the city, but it was not the last. In the 1960s, the mayor planned a major redevelopment of the Dearborn Avenue corridor. C.F. Murphy participated in partnerships on three buildings that redefined this corridor of downtown Chicago, including the Richard J. Daley Center (1965), the Chicago Federal Center (1974), and the First National Bank of Chicago (1969). The firm would continue to complete numerous civic commissions for the City of Chicago, employing the Miesian style to recast the city's image in the postwar era.<sup>116</sup> C.F. Murphy did not complete this task alone, however. Throughout the 1960s and 1970s the majority of the firm's projects were the products of multiple architects and designers collaborating within the firm, as well as partnerships with other reputable firms such as SOM and Mies's private firm.

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<sup>112</sup> Condit, *Chicago: 1930-70: Building, Planning, and Urban Technology*, 259; Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)*, 166, 193, 196; C.F. Murphy Associates, *C.F. Murphy Associates* (Chicago: C.F. Murphy Associates, 1975).

<sup>113</sup> City of Chicago, Department of Aviation, *Annual Report 1963*, December 31, 1963, 6, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport, Northwestern University Transportation Library, <https://archive.org/details/annualreport1963chic>.

<sup>114</sup> "Our Two Largest Airports," *Progressive Architecture* XLIV, no. 8 (August 1963): 103.

<sup>115</sup> Ross Miller, "City Hall and the Architecture of Power," in *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: Prestel and The Art Institute of Chicago, 1993), 253.

<sup>116</sup> Miller, "Helmut Jahn and the Line of Succession," 305; Miller, "City Hall and the Architecture of Power," 249-57; C.F. Murphy Associates, *C.F. Murphy Associates*.

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In 1967 Mayor Daley commissioned C.F. Murphy to design a new exhibition hall at McCormick Place. To assist with the project, the firm hired Eugene Summers, who brought his assistant Helmut Jahn to the firm as well. As a student of Mies, Summers was devoted to the modernist principles of the Second Chicago School of Architecture. Jahn, on the other hand, gained a reputation for being more flexible in his designs. By 1973 Jahn was promoted to Executive Vice President and Director of Planning and Design within C.F. Murphy and spent the remainder of the decade expanding the firm's stylistic range on multiple projects around the United States, but particularly in Chicago. As Ross Miller argued, "Within the framework of C.F. Murphy's bread-and-butter civic commission of the 1970s, Jahn methodically renewed the firm and established his own reputation."<sup>117</sup> In 1982, Jahn gained a controlling interest in C.F. Murphy and changed the firm's name to Murphy/Jahn, while significantly reducing the size of the firm. Charles Murphy, Sr. passed away in 1985.<sup>118</sup> Following his takeover of the firm, Jahn designed multiple postmodern and late-modern buildings across the United States and internationally, including airports in Cologne, Munich, Bangkok, and Chicago.

Jahn also continued C.F. Murphy's work at O'Hare. Murphy/Jahn led O'Hare Associates, a joint venture of multiple firms, to complete the ODP. Helmut Jahn is credited with the overall design of the new Terminal 1 (1988) and the facade improvements to Terminals 2 and 3 (2006).<sup>119</sup> In 2012 Jahn renamed the firm to JAHN.<sup>120</sup> The firm continues to work internationally while maintaining its main offices in Chicago.

#### (5) Stanislaw Gladych

Stanislaw Gladych was the chief designer for the O'Hare expansion project that began in the late 1950s and continued through the early 1960s. A brief biography of Stanislaw is provided as context for understanding how the design of O'Hare fits within the context of Gladych's influences and role in Chicago modern architecture in the mid-twentieth century.

Stanislaw Z. Gladych was born in Poland in 1921. During World War II, Gladych worked in the underground resistance, and was captured by the Russian army and sent to Siberia.<sup>121</sup> Once released, he was sent to Britain and then served in the Polish Air Force and was shot down more than once.<sup>122</sup> After the war, Gladych remained in England, attending the architecture school at the University of Liverpool.

<sup>117</sup> Miller, "Helmut Jahn and the Line of Succession," 307.

<sup>118</sup> Heise, "Charles F. Murphy, Chicago Architect."

<sup>119</sup> "Transportation," *JAHN*, accessed August 20, 2019, <https://www.jahn-us.com/transportation>; O'Hare Associates, *Chicago O'Hare International Airport O'Hare Development Program* (Prepared for the City of Chicago, December 1982); Gapp, Paul, "O'Hare at the Turning Point: Is Delta's Sparkle the New Direction?," *Chicago Tribune*, August 19, 1984, sec. 13.

<sup>120</sup> Nory Miller, *Helmut Jahn* (New York: Rizzoli, 1986), 7; "Transportation"; Melissa Harris, "Name Change, New Design Leadership at Murphy/Jahn," *Chicago Tribune*, accessed August 20, 2019, <https://www.chicagotribune.com/business/ct-xpm-2012-10-26-chi-name-change-new-design-leadership-at-murphyjahn-20121026-story.html>.

<sup>121</sup> Schulze, *Oral History of Carty Manny*, 153.

<sup>122</sup> Schulze, *Oral History of Carty Manny*, 153.



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Upon graduating in 1950, Gladych immigrated to the United States and was hired by SOM at their New York office.<sup>123</sup> He was sent to Okinawa, Japan to assist in designing United States military facilities, and then transferred to SOM's Chicago office, where he was selected as the lead designer for the Air Force Academy at Colorado Springs, Colorado.

When the Air Force Academy project came to a close in 1956, Gladych left SOM to join Naess & Murphy (renamed C.F. Murphy Associates in 1960).<sup>124</sup> That same year, Gladych became a partner at the firm and was selected as the designer for the Central Water Filtration Plant in Chicago.<sup>125</sup> This became the world's largest water filtration plan, and its Miesian design was honored with an award by *Progressive Architecture* magazine.<sup>126</sup> Although never a student of Mies, Gladych was intrigued by Mies's design philosophy, and utilized these Second Chicago School of Architecture principles in much of his important works.<sup>127</sup>

Gladych was selected to work as chief designer for the O'Hare master plan project under project manager Carter Manny, Jr. Beginning in 1956, this project required a rework of an existing plan to expand the airport, which culminated into the 1958 master plan. Gladych was responsible for applying Miesian design principles to the terminal buildings and the H&R Plant. During the design process he was assisted by other key figures in the O'Hare project, including Carter Manny, Jr., Walter Metschke, Otto Stark, and Gertrude Lempp Kerbis.

According to Manny, Jr., Gladych had envisioned an H&R Plant resembling Mies's Crown Hall at the Illinois Institute of Technology. His original vision was to use thinner mullions to create a much a clean, slender design. However, project engineer Sherwin Asrow favored the larger steel mullions to prevent the curtain wall from buckling.<sup>128</sup> The final design featured wide protruding H-shaped columns and large steel mullions along all elevations.<sup>129</sup> Although Gladych was unable to execute his original vision, the H&R Building clearly reflected Miesian design principles such as streamlined rectilinear forms, honest use of building materials, and integration of indoor and outdoor space.

In 1964 C.F. Murphy Associates and Perkins & Will were selected to design the First National Plaza Building in Chicago, and Gladych was assigned as the designer. Completed in 1969, the First National Plaza Building was a 60-story skyscraper that had a distinctive curvilinear shape defined by its slightly

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<sup>123</sup> Schulze, *Oral History of Carty Manny*, 154.

<sup>124</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals."

<sup>125</sup> Schulze, *Oral History of Carty Manny*, 153.

<sup>126</sup> Schulze, *Oral History of Carty Manny*, 177.

<sup>127</sup> Schulze, *Oral History of Carty Manny*, 178.

<sup>128</sup> Schulze, *Oral History of Carty Manny*, 210.

<sup>129</sup> Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant FDTNS, Building No. 11, Contract No. RB 32, Chicago O'Hare International Airport"; Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant, Structural Steel - Building No. 11, Contract No. RB 39, Chicago O'Hare International Airport"; Naess & Murphy Architects-Engineers, "As-Built Plans for Terminal Area Heating and Refrigeration Plant, Architectural, Structural, Mechanical, Electrical, Contract No. RB 35, Chicago O'Hare International Airport."

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flared base. Also completed in 1968 was the Mercy Hospital in Chicago, which was designed by C.F. Murphy, with Gladych as lead designer.

The J. Edgar Hoover FBI Building in Washington, D.C., was one of Gladych's largest commissions during his time at C.F. Murphy. Designed in several phases beginning in 1967 and ending in 1977, the building exhibits a strong sense of Brutalism in its monolithic form and extensive use of concrete. It stirred controversy over the appropriateness of such a design and scale within the nation's capital. Original concepts by Gladych exhibited a more Miesian character, which he eventually dropped in favor of a Brutalist design that Gladych described as "expressing the 'precise, integrated form of the FBI.'"<sup>130</sup> However, the design was nearly universally panned by architecture critics and the public.<sup>131</sup>

In 1972 Gladych left C.F. Murphy to join an engineering consulting firm, Howard, Needles, Tammen and Bergendoff (HNTB), where he served as president for one year.<sup>132</sup> By 1973 Gladych left HNTB to work on his own, starting a firm called S.Z. Gladych Design & Planning Consultant, before retiring shortly afterward.<sup>133</sup>

#### **(6) Ludwig Mies van der Rohe, Miesian Architecture, and the Second Chicago School of Architecture**

This background on Ludwig Mies van der Rohe and the Second Chicago School of Architecture is provided to understand how the H&R Plant fits into the context of Miesian architecture, which was an influential style from its introduction in the U.S. in 1940 until the 1960s. The Second Chicago School style is apparent among the buildings constructed at O'Hare in the 1960s and 1970s, and continued in modifications to the H&R Plant in the 1980s.

Mies is best known for promoting a particularly streamlined version of Modern architecture that came to define the American city in the years after World War II. As the head of the architecture department at the Illinois Institute of Technology (IIT), he trained a generation of architects to follow his philosophy of architecture based on reducing buildings to their most essential elements. Mies developed much of his philosophy as a young architect in Germany, where he became associated with the International Style of architecture. The architects of the International Style believed that modern society had become "impersonal and collective" and that new architecture should reflect that view. Mies embraced the "impersonal nature of modern technology itself," and dedicated himself to the perfection of artistry through the use of modern materials and methods.<sup>134</sup> Rejecting all sense of subjectivity, he aspired to objectivity in architecture by reducing buildings to their most basic elements. The goal of his stylistic reductionism was a focus on the creation of space, both exterior and interior. The combination of intentionally reductive architecture establishing defined, yet open and connected, space through the precise expression of

<sup>130</sup> Aarons, Leroy F., "Group Hails Design for FBI Offices," *The Washington Post*, October 2, 1964, sec. B.

<sup>131</sup> Eckardt, Wolf Von, "Rating Washington's Architecture," *The Washington Post*, January 6, 1974.

<sup>132</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals."

<sup>133</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals."

<sup>134</sup> Richard Pommer, "Mies van Der Rohe and the Political Ideology of the Modern Movement in Architecture," in *Mies van Der Rohe: Critical Essays* (Cambridge, Mass.: MIT Press, 1989), 133.

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modern materials embodies Mies's philosophy. This design concept was well summarized by architect Werner Blaser:

Space is primary and the position of the walls is determined by it. Interior and exterior form a whole. In this spatial freedom the static principle of slab, beam and column, i.e. of load and support, can be expressed. As the logical sequel to these lucid requirements we have the articulation of proportions in surface and space.<sup>135</sup>

Mies brought this philosophy to the United States in 1938, when he accepted an invitation to develop a new curriculum for the architecture department at the Armour Institute in 1938, which became IIT in 1940. Under Mies, the architecture department of IIT grew from a relatively unknown technical school to one of the most influential architecture programs in the country."<sup>136</sup> The Armour Institute was founded in 1890, during the rise of the First Chicago School of Architecture. The architects of the First Chicago School, such as Louis Sullivan, Daniel Burnham, and John Wellborn Root, among others, developed a new system of architecture that "emphasized structure and function over ornamentation."<sup>137</sup> Mies advanced Sullivan's famous slogan "form follows function" toward the design of a form so basic that it could suit any function. The architects trained under and influenced by Mies's curriculum became known as the Second Chicago School of Architecture, in part because they extended the ideals of those earlier architects to new levels of austerity and functionality.

Mies preferred the term *Baukunst*, or "building art," over "architecture" and developed a meticulous curriculum based on five principles including structure, space, proportion, materials, and the fine arts. Instead of direct instruction, Mies encouraged his students to examine each of these principles objectively through various exercises during the first four years of study; only in the fifth and final year did students apply their methods on tangible projects. Mies intended for his students to embrace a purely rational method of design and reject any subjectivity. The outcome of this curriculum was a generation of architects who absorbed everything the master teacher shared with them, but also developed an inflexibility of style. As James Ingo Freed, a student of Mies and later the Dean of Architecture at IIT, recalled, the four years of exercises "eliminated all other options...by the time you got to the fifth year you didn't know what to do except what you had already done."<sup>138</sup> Comparing education to training, Freed argued, "Education implies free will; and there was little of that there."<sup>139</sup>

Over the following decades, the architects of the Second Chicago School built a multitude of efficient steel, glass, and concrete rectangular towers that came to define the American metropolis. The primary features of the Miesian style include rectilinear forms, a lack of ornamentation beyond accentuating the building materials, use of modern materials such as glass and steel, and open internal and external spaces framed by the building. This form was, for a time, ideally suited to the postwar American economy,

<sup>135</sup> Werner Blaser, *Mies van Der Rohe: Continuing the Chicago School of Architecture*, Second edition (Basel, Boston, Stuttgart: Birkhauser Verlag, 1981), 7.

<sup>136</sup> Blaser, *Mies van Der Rohe: Continuing the Chicago School of Architecture*, 30.

<sup>137</sup> "Mies: The Man, The Legacy," *Mies Van Der Rohe Society*, accessed August 16, 2019, <http://miessociety.org/mies/>.

<sup>138</sup> James Ingo Freed and Franz Schulze, "Mies in America: An Interview with James Ingo Freed Conducted by Franz Schulze," in *Mies van Der Rohe: Critical Essays* (Cambridge, Mass.: MIT Press, 1989), 186.

<sup>139</sup> Freed and Schulze, "Mies in America: An Interview with James Ingo Freed Conducted by Franz Schulze," 186.

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which was steadily shifting away from manufacturing towards companies that necessitated more and more centralized office spaces. The Miesian model also matched the goals of civic leaders such as Mayor Daley of Chicago, who not only saw it as efficient, but as an emblematic symbol of modernity. The Second Chicago School provided the rational order that American business and civic leaders desired to reshape the country in an age of unprecedented prosperity.

While teaching at IIT, Mies continued to work as a professional architect and produced three of his most iconic and influential buildings in the 1950s. The first of these are the apartments at 860 and 880 Lake Shore Drive (1948-1951) in Chicago, which have been described as one of the “most influential designs for high-rise structures of the twentieth century.”<sup>140</sup> With the Lake Shore Apartments, he aspired toward transparency of the structural design and building materials. Because fire codes required the steel skeleton to be encased in concrete, Mies chose to weld non-structural I-beams to the facade to give emphasis to the structure and materials beneath. In addition, the positioning of the buildings on an irregular lot create a clear and defined exterior space, with orientation directed simultaneously to the street and the lake. Secondly, Crown Hall (1950-1956), in the center of the campus designed by Mies at IIT, defined Mies's desire to merge interior and exterior space. The structure of the building is entirely transparent, with the ceiling clearly suspended from the exterior superstructure, creating an entirely free and open interior space. That space is also surrounded by a continuous curtain wall that completely opens interior workspace to the exterior space of the campus. The designs of these two buildings were brought together in the Seagram Building in New York City (1958). The appearance of the Lake Shore apartments is replicated here on a taller and grander scale, with bronze I-beams ascending the facade of the building. The building is set back from the street to create a plaza, representing a large public space in the urban fabric of the city. Although the continuous curtain wall of Crown Hall is missing, the structure of the Seagram Building allows for large, flexible, open spaces on each floor.<sup>141</sup>

The influence of these three iconic buildings on the Second Chicago School architects can be seen in two high-profile buildings in downtown Chicago. The Continental Center (1962) was designed by Jacques Brownson and James Ferris of C.F. Murphy Associates. Both of these architects studied under Mies at IIT in the 1940s and 1950s, and Brownson even continued as an instructor. The Continental Center has an unadorned rectangular massing with exposed steel framing. The interior features open, column-free floorplans completely surrounded by floor-to-ceiling glass walls, reminiscent of the Crown Hall interior. The architects employed modern materials and engineering to design a minimal structure supported by only 20 columns with three 42-foot-wide bays on the facade. In addition, the first floor is recessed in the same manner as the Lake Shore Apartments and Seagram Building.<sup>142</sup> A second building of note is the Chicago Civic Center (Richard J. Daley Center, 1965). Brownson is credited as the architect of record, but the entire project was a joint venture between the Chicago-based firms C.F. Murphy Associates; SOM; and Loeb, Schlossman, and Bennett. The Civic Center appears to very similar to the Continental Center

<sup>140</sup> Franz Schulze, *Mies van Der Rohe: A Critical Biography* (Chicago and London: The University of Chicago Press, 1985), 241.

<sup>141</sup> “Mies van Der Rohe Biography, Life & Quotes | TheArtStory,” accessed August 16, 2019, [https://www.theartstory.org/artist/mies-van-der-rohe-ludwig/life-and-legacy/#biography\\_header](https://www.theartstory.org/artist/mies-van-der-rohe-ludwig/life-and-legacy/#biography_header); Schulze, *Mies van Der Rohe: A Critical Biography*, 275.

<sup>142</sup> *Continental Center: Landmark Designation Report* (Prepared for Commission on Chicago Landmarks, July 7, 2011), 6, 9, 12–13.



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on a larger scale, with three 87-foot bays across the facade supported by 12 exterior columns and continuous curtain walls encircling each story. However, the Civic Center is surrounded by an enormous plaza that occupies 65 percent of the building's site, repeating the plaza of the Seagram Building and echoing Mies's focus on exterior space.<sup>143</sup> The two prominent buildings showcase the designs and philosophy of the Second Chicago School architects as they worked to rebuild the nation's cities in the postwar period.

Buildings constructed at O'Hare in the 1960s and 1970s employed the Second Chicago School style. Gladych was not trained by Mies but was greatly influenced by Mies's philosophies. As Carter Manny, Jr. described Gladych, he was "more Miesian than Mies."<sup>144</sup> Along with designs of Terminals 2 and 3, the design of H&R Building was clearly reminiscent of Mies's Crown Hall. Although Gladych was unable to fully execute his vision for an H&R Building closely resembling Mies's Crown Hall due to potential engineering issues, the building clearly reflected Miesian design characteristics with its extensive glass exterior and exposed steel structure, streamlined rectilinear design, and honest use of building materials. The building's curtain walls created a sense of openness allowing natural light to flood the interior and permitting onlookers from the outside a full view of the maze of pipes and machinery within. The H&R Plant, as well as the terminal buildings, were constrained by other design requirements of the airport, and do not reflect Mies's interest in creating a defined exterior space. However, this element is present in the design of the O'Hare Hilton Hotel. The curved facade of the hotel is not strictly Miesian; however, it is balanced with the terminal roadway to create an exterior plaza, with the control tower as its central feature, that is reminiscent of the Mies's Lake Shore Apartments and the Seagram Building.<sup>145</sup>

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<sup>143</sup> Miller, "City Hall and the Architecture of Power," 255; Jan C. Rowan, ed., "Civic Center: Dignity and Continuity," *Progressive Architecture* 47, no. 10 (October 1966): 247; "Richard Daley Center," *The Architecture Week Great Buildings Collection*, accessed August 22, 2019, [http://www.greatbuildings.com/buildings/Richard\\_Daley\\_Center.html](http://www.greatbuildings.com/buildings/Richard_Daley_Center.html).

<sup>144</sup> Schulze, *Oral History of Carty Manny*, 155.

<sup>145</sup> Schulze, *Oral History of Carty Manny*, 234, 288–89.

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### 3. Recommendation

#### A. Significance

The H&R Plant, including the main H&R Building, three cooling towers, and two substations, was evaluated for National Register of Historic Places (National Register) eligibility under *Criteria A, B, C, and D*. Evaluation under each of the National Register Criteria and discussion of period and level of significance and historic integrity is provided below.

##### (1) *Criterion A*

Under *Criterion A*, "Properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history."

The main H&R Building was completed in 1962 during a period of major airport growth and represents one aspect of the improvement program undertaken at O'Hare during the early 1960s. At this time Terminals 2 and 3, the Rotunda, and other support facilities were constructed based on the 1958 airport master plan to support airport expansion.<sup>146</sup> The introduction of jet-engine-powered aircraft to commercial air travel in the late 1950s, which became known as the "jet age," precipitated substantial changes to airport design and operations, pressuring City officials to expand O'Hare to serve this increase in air travel and secure Chicago's standing as a transportation center. Following this expansion, O'Hare has served as one of the busiest airports in the United States.<sup>147</sup> The H&R Building was included in the 1958 master plan and constructed to support the airport's expansion. Although it was an integral part of the airport's overall design, it was one of the airport's many support facilities constructed at the time and does not individually represent O'Hare's period of expansion in the 1960s. As such, the building did not play a significant and direct role in Chicago transportation history during this period.

In response to deregulation and increases in air traffic, continuous improvements to O'Hare have been made since the 1960s. The first major expansion of the H&R Plant was carried out and completed in 1974. The 1978 Airline Deregulation Act dramatically changed the nature of air travel in the U.S. By consolidating flights into regional hubs, airlines were able to significantly increase the number of flights they were able to operate. This in turn created the need for a change in airport design to accommodate the increase of both aircraft and passengers at the country's major airports. City officials at O'Hare responded to these aviation industry changes by planning for and then executing the O'Hare Development Program in the 1980s and 1990s. Further expansions to the H&R Plant, including a second major addition along the H&R Building's west elevation, the addition of a third cooling tower, and construction of two substation buildings, were completed as part of the development program in the 1980s. By 1987 the front facade of the main H&R Building had been replaced. These expansions and the addition of new cooling towers and substations resulted in an H&R Plant that reflects these later eras of construction as much as its displays the initial construction from 1962. Additional changes to the plant occurred after 1987, including the replacement of the original cooling tower in 1994, replacement of the

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<sup>146</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 11.

<sup>147</sup> "Chicago O'Hare International Airport, Crossroads of the World."

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1974 north cooling tower in 2006, and replacement of the 1987 east cooling tower in 2014. These expansions and additions completed between 1974 and 2014 were carried out in order to meet the continuous growth needs of the airport; the plant represents only one aspect of that growth. As such, the H&R Plant, as it had evolved by 2014 to include the City Substation, RB 40 Substation, and three cooling towers, does not possess significance for its association with the growth of O'Hare in the 1960 and 1970s, the post-deregulation modernization program of the 1980s and 1990s, or broad patterns of transportation history at the airport. For these reasons the H&R Plant is recommended not eligible for listing in the National Register under *Criterion A*.

#### (2) *Criterion B*

Under *Criterion B*, "Properties may be eligible for the National Register if they are associated with the lives of persons significant in our past."

The H&R Plant is not directly associated with any persons of historical significance outside of its architects, engineers, and designers, which are addressed under *Criterion C*. As such, it is recommended not eligible for listing in the National Register under *Criterion B*.

#### (3) *Criterion C*

Under *Criterion C*, "Properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction."

Completed in 1962, the original O'Hare H&R Plant was one the earliest centralized heating and refrigeration plants constructed at a major airport utilizing a high-temperature water (HTW) heating system. HTW heating technology had been previously developed and used widely in Europe by the end of World War II; however, in the United States it remained primarily isolated to military installations until the late 1950s. Similar plants were completed at Idlewild Airport (now JFK) five years earlier in 1957 and Los Angeles International Airport by 1962; however, research revealed no other earlier comparable examples constructed on major airports. O'Hare's H&R Plant was heralded as a plant "designed for the future" at the time of its opening.<sup>148</sup> One *Chicago Tribune* article claimed it was "one of the largest and most modern heating and cooling plants in the Midwest, and one of the most unusual in the nation" and another claimed its HTW plant was "one of the few of its kind in the country."<sup>149</sup> When completed in 1962, it was an early and uncommon installation of a centralized heating and cooling plant utilizing HTW heating technology. The O'Hare H&R Plant is directly associated with the history of the development modern heating, cooling, and ventilation technology in the middle twentieth century. For these reasons, the H&R Plant possesses significance for the National Register under *Criterion C* in the area of Engineering.

Expansions of the H&R Plant between 1974 and 2014 included additions to the existing facility using similar heating and cooling technology (HTW generators and centrifugal chillers) that had already been developed. The plant has also undergone continuous upgrades to integrate updated and modern control

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<sup>148</sup> James, "Miles of Pipe Keep Airport Warm, Cool."

<sup>149</sup> James, "Miles of Pipe Keep Airport Warm, Cool"; "A View from Beneath the Field."

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equipment. Research did not reveal evidence that these upgrades represented exceptionally significant engineering. The H&R Plant, as it had evolved by 2014, does not represent exceptionally significant developments in heating and cooling technology, and therefore does not meet *Criteria Consideration G: Properties That Have Achieved Significance Within the Past Fifty Years*. Therefore, its period of significance under *Criterion C* in the area of Engineering is limited to 1962, its date of initial construction.

The H&R Plant represents an architecturally distinctive example of a mid-twentieth-century central heating and cooling plant integrated into a larger airport design. O'Hare's expansion plan developed by Naess & Murphy and Landrum & Brown in the late 1950s followed the emerging trend toward decentralization and included multiple terminals connected by a looping roadway. The H&R Plant was an integral part of O'Hare's overall design and it was at the forefront of an emerging trend to utilize the central plant model on major airports around the country. The H&R Plant followed the general design trends of other large central plants of the mid-twentieth century, such as an interior floorplan including large open spaces to house mechanical equipment and separate administrative spaces, utilitarian interior finishes, integration of air conditioning equipment, and conformity to the predominant architectural style of the complex. The H&R Plant featured these common design elements and incorporated the latest advancements in heating and refrigeration technology on a massive scale. Few comparable central plants constructed by early 1960s matched the size and complexity of O'Hare's H&R Plant. Known comparable examples included central plants at JFK completed in 1957 and LAX completed by 1962.

The H&R Plant also embodied the principles of Miesian style architecture, also known as the Second Chicago School of Architecture, which developed in Chicago following principles set forth by Ludwig Mies van der Rohe. The main H&R Building exhibited distinctive elements of the Miesian style such as rectilinear forms, a lack of ornamentation beyond accentuating the building materials, use of modern materials such as glass and steel, and open internal and external spaces framed by the building. Critics praised the H&R Building's modern form, integration of indoor and outdoor space, and cohesion with the architecture of the terminal buildings. As originally constructed in 1962, O'Hare's H&R Plant represented a distinctive and significant example of a large mid-twentieth-century central heating and cooling plant that embodied the Miesian architectural style. Therefore, the original H&R Plant possesses National Register significance under *Criterion C* in the area of Architecture.

Stanislaw Gladych served as the lead designer for the H&R Plant, assisted by several other members of the Naess & Murphy team including project manager Carter Manny, Jr. in addition to contributions by Landrum & Brown. According to first-hand accounts from designers on the project, the H&R Plant and other O'Hare buildings associated with the 1958 master plan were designed with substantial input and detailed development by other members of the design team and was not the sole creative work of Gladych. As such, the H&R Plant does not represent the creative product of any single individual and does not reflect the work of any particular "master" architect, artisan, or craftsperson. Similarly, the design and planning of the H&R Plant does not appropriately reflect the works of Naess & Murphy in any manner that would be a significant association with the architectural firm.

The H&R Plant underwent several major expansions in the 1970s and 1980s as a result of growth and modernization of O'Hare. Changes included major expansions on the main H&R Building's north elevation in 1974 and an expansion and full replacement of its front (west) facade in 1987. Two new



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cooling towers were added along with each major expansion, and all three have since been replaced beginning with the original tower in 1994. Expansions in the 1980s also included the construction of two substations: the RB 40 Substation and the City Substation. Additions to the main H&R Building reproduced the original Miesian design and exhibited cohesion between original and new portions of the exterior. Furthermore, the flat-roof, rectangular, metal and glass exteriors of both substations complemented the H&R Plant. These expansions and additions were sympathetic to the H&R Plant's original Miesian design; however, they were constructed after the heyday of the Second Chicago School and do not represent an exceptionally significant example of an airport central plant or the Miesian architectural style as applied in the 1980s. Therefore, the H&R Plant as it had evolved between 1962 and 2014 does not meet *Criteria Consideration G: Properties That Have Achieved Significance Within the Past Fifty Years*. Its period of significance under *Criterion C* in the area of Architecture is limited to 1962, its date of initial construction. However, due to loss of integrity as explained below, the H&R Plant no longer conveys significance to 1962, and is therefore recommended not eligible for individual listing in the National Register under *Criterion C*.

#### (4) Criterion D

Under *Criterion D*, "Properties may be eligible for the National Register if they have yielded, or may be likely to yield, information important in prehistory or history."

The design, construction, and alterations of the H&R Plant have been well documented, and it is unlikely that the building has potential to yield important information that is not otherwise accessible. As such, the H&R Plant is recommended not eligible for listing in the National Register under *Criterion D*.

#### (5) Period of significance

The period of significance for H&R Plant was determined to coincide with its date of construction: 1962. Expansions to the main H&R Plant constructed after 1962 were found not to possess significance; therefore, the period of significance is limited to 1962.

#### (6) Level of significance

The H&R Plant, as originally constructed in 1962, was evaluated for significance as an early and uncommon installation of a centralized heating and cooling plant utilizing HTW heating technology at the national level under *Criterion C: Engineering*, and for embodying the distinctive characteristics of a central heating and cooling plant designed and constructed in the Miesian style at the national level under *Criterion C: Architecture*.

### B. Integrity

To be eligible for inclusion in the National Register, a property must exhibit historic integrity to convey its significance, in addition to being associated with one or more of the National Register Criteria listed above. The H&R Plant was evaluated based on the seven aspects of integrity below: location, design, setting, materials, workmanship, feeling, and association. The evaluation of integrity for the H&R Plant was assessed to a period of significance of 1962.

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- **Location** – The H&R Plant remains in its original location and therefore retains integrity of location.
- **Design** – The H&R Plant has undergone several major expansions that have affected its design as it relates to its significance as a Miesian style central plant utilizing HTW technology during the period of significance. Alterations to the H&R Plant that affect integrity of design include a major expansion on the north elevation in 1974, a major expansion and replacement of the front (west) facade in 1984, the demolition of the original redwood cooling tower in the 1990s, and continuous upgrades, replacements, and relocation of the plant's heating and refrigeration equipment. The H&R Plant was designed with future expansion in mind; however, the areas designated for future expansion on original design drawings amounted to only a fraction of the actual expansions carried out. Additionally, although the additions were sympathetic and mimicked the H&R Building's original Miesian composition, they were essentially a reconstruction of the style, which had fallen out of favor by the mid-1980s. As such, the H&R Plant does not retain integrity of design to convey significance under *Criterion C: Engineering* or *Criterion C: Architecture* during its period of significance.
- **Setting** – The addition of several recent cooling towers and extension of the Concourse L “Stinger” around the south and east sides of the main H&R Building has resulted in diminished integrity of setting; however, the H&R Plant continues to retain its general orientation within the overall airport complex from its period of significance. Therefore, the H&R Plant retains sufficient integrity of setting to convey significance under *Criterion C: Engineering* or *Criterion C: Architecture* during its period of significance.
- **Materials** – The main H&R Building has experienced changes to its exterior and interior materials since its original construction in 1962, including a major expansion to the north by 1974, major expansion and replacement of the front (west) facade in 1987, and interior material changes within administrative spaces of the building. These expansions of the main H&R Building involved the removal of original exterior materials along the north and west sides of the building. Materials were reused when possible; however, the increased size and scale of the additions necessitated the introduction of new exterior materials such as glass, structural columns, and mullion members. In addition, continuous upgrades and replacements have resulted in a loss of original mechanical equipment, including recent and in-progress replacement of original HTW generators. As such, the H&R Plant does not retain integrity of materials to convey significance under *Criterion C: Engineering* or *Criterion C: Architecture* during its period of significance.
- **Workmanship** – The H&R Plant does not convey integrity of workmanship due to the substantial loss of original material caused by alterations and upgrades to the H&R Plant over time. As such, the H&R Plant does not retain sufficient workmanship from its period of its original construction to convey significance under *Criterion C: Engineering* or *Criterion C: Architecture*.
- **Feeling** – Due to major expansions to the H&R Building that have vastly increased its overall scale, changes to setting resulting from the addition of several recent cooling towers and extension of the Concourse L “Stinger” around the south and east sides of the main H&R

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Building, and continuous upgrades, replacements, and relocation of heating and refrigeration equipment, the H&R Plant has lost its integrity of feeling to convey significance under *Criterion C: Engineering* and *Criterion C: Architecture* during its period of significance.

- **Association** –The H&R Plant retains its association with the development of centralized heating plants utilizing HTW heating technology as it continues to serve the airport as a central heating and air-conditioning plant in a similar manner as designed in the early 1960s using an HTW heating system.

#### C. Eligibility

The H&R Plant possesses significance under National Register *Criterion C* in the areas of Engineering and Architecture; however, it does not retain sufficient integrity with relation to design, materials, workmanship, or feeling to convey significance under either criterion during its period of significance of 1962. Therefore, the H&R Plant is recommended not eligible for listing in the National Register.

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## **G-2.8. Telephone Building and Garage**



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Great Lakes Region  
Illinois, Indiana, Michigan,  
Minnesota, North Dakota,  
Ohio, South Dakota,  
Wisconsin

Chicago Airports District Office  
2300 East Devon Avenue  
Des Plaines, Illinois 60018

November 4, 2019

Mr. Anthony Rubano  
Acting Cultural Resources Coordinator  
State Historic Preservation Office  
IDNR – One Natural Resources Way  
Springfield, IL 62702-1271

Mr. Rubano:

Enclosed you will find a copy of a document entitled, *Determination of Eligibility: O'Hare Telephone Building and Garage, Chicago O'Hare International Airport*. We request that you review the Federal Aviation Administration document to determine if you concur that the O'Hare Telephone Building and Garage are not eligible for listing on the National Register of Historic Places.

If you have any questions, please feel free to call me at (847) 294-7354.

Sincerely,

A handwritten signature in black ink that reads "Amy B. Hanson".

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration

Cc: Aaron Frame, City of Chicago Department of Aviation  
Jamie Rhee, City of Chicago Department of Aviation



## Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271  
www.dnr.illinois.gov

Mailing Address: 1 Old State Capitol Plaza, Springfield, IL 62701

JB Pritzker, Governor  
Colleen Callahan, Director

FAX (217) 524-7525

Cook County

Chicago

National Register Eligibility, O'Hare Telephone Building and Garage at O'Hare International Airport  
10000 W. O'Hare Ave.  
SHPO Log #011120219

December 18, 2019

Amy Hanson  
U.S. Department of Transportation  
Federal Aviation Administration  
Chicago Airports District Office  
2300 E. Devon Ave., Suite 201  
Des Plaines, IL 60018

Dear Ms. Hanson:

Thank you for requesting comments from our office concerning the possible effects of your project on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

In our opinion, we disagree with your finding and have determined that the O'Hare Telephone Building and Garage are eligible for listing on the National Register of Historic Places.

If you have any questions, please call 217/782-4836.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert F. Appleman". The signature is fluid and cursive, with a long horizontal stroke at the end.

Robert F. Appleman  
Deputy State Historic  
Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation  
Jamie Rhee, Commissioner, Chicago Department of Aviation



**From:** Hanson, Amy (FAA) <Amy.Hanson@faa.gov>  
**Sent:** Monday, December 30, 2019 3:43 PM  
**To:** Amy Squitieri; Christina Slattery  
**Cc:** dwasiuk@hmmh.com; Kurt M. Hellauer; ORDTAP; Colleen Bosold; Brad Rolf  
**Subject:** FW: FAA response to SHPO notice of disagreement on the Determination of Eligibility for the O'Hare Telephone Building and Garage, Chicago O'Hare International Airport

**Follow Up Flag:** Flag for follow up  
**Flag Status:** Completed

**Categories:** Filed by Newforma

Forwarding:

Amy B. Hanson  
 Environmental Protection Specialist  
 Chicago Airports District Office  
 Federal Aviation Administration  
 847-294-7354

---

**From:** Rubano, Anthony <Anthony.Rubano@Illinois.gov>  
**Sent:** Monday, December 30, 2019 3:21 PM  
**To:** Hanson, Amy (FAA) <Amy.Hanson@faa.gov>  
**Cc:** Wallace, Carol <Carol.Wallace@Illinois.gov>  
**Subject:** RE: FAA response to SHPO notice of disagreement on the Determination of Eligibility for the O'Hare Telephone Building and Garage, Chicago O'Hare International Airport

Hi Amy,

Sorry about that. You were clear that you wanted an explanation of why we disagreed on the eligibility of the telephone building and garage, and we intended that our letter include such an explanation, but it just didn't make it in there. We will issue a revised letter that contains the explanation. In the meantime, here's the meat of that forthcoming letter:

This office does not concur with the FAA's determination that the O'Hare Telephone Building and Garage are not eligible for the NRHP.

Page 45 states that the 1960-61 building does not have significance for its association related to technological development or innovation related to telecommunications and in particular to electronic switching because it predates the roll out of electronic switching in 1965, and there is no indication it was designed for electronic switching equipment. It's not proper to say that because a building predates a technological development by 4 years (and that because it did not predict that development), the building is not significant. While it may be true that the building is not significant for electronic switching, that's not the proper technological context to which to compare it. This was the nerve center for airport communications. Just as the control tower is the nerve center for the aviation communication in an airport, this was the nerve center for the ground-based communication. O'Hare would not have been able to function without either. Bell Telephone gave this small building and its equipment a budget of \$4 million or about \$35 million in today's money. It's about 24,000 square feet in size, which means that it cost about \$1,600 per square foot (almost \$14,000 per square foot today). That's an enormous per-square foot cost, and a good indicator of the level of attention and technology

this center was given. It contained the most current and advanced equipment that was available, several banks of which survive inside on the second floor. The March 11, 1960 *Tribune* article "Plan 'Dial Anywhere' O'Hare Phone System" stated: "No other airport in the world will have a system exactly like O'Hare...O'Hare's new net will be like the newest military phone communications network." A 10/5/61 *Tribune* article ("O'Hare to Get Improved New Phone System") states: "That the new center will be an electronic marvel is proven by the service that is planned for the airport and surrounding territory, telephone company officials said. All subscribers, including air lines and concessionaries at the huge field, will be served by a single control office and, thru an electronic relay system, it will be necessary to dial only four numbers for immediate connection to any telephone on the base from any other telephone on the base...The cost for calls from O'Hare to Chicago will drop from 15 to 10 cents each, resulting in a saving to the public and eliminating the need for an operator's assistance in such calls. The new building will not be served by overhead wiring but by lines placed in underground ducts within the airport property." The technology in this building reduced the cost of calls to and from the airport by a third. Clearly the technology was state of the art for 1961, even by military standards, and should not be dismissed because it doesn't represent developments that occurred in 1965.

Page 45 says the building was not outlined in the master plan. But a 3/11/60 *Tribune* article states "The site was chosen with the approval and consultation of Naess and Murphy, the architectural and general contract managing firm for the City in the major O'Hare development program." Page 45 also says that it is not a significant example of the expansion of O'Hare and did not play a significant role in Chicago transportation history. It is not correct. As the sole and dedicated communications center for the airport, it played a critical role in O'Hare's very function. All airline, terminal, gate, and concessionaire communication routed through this facility, as did all calls incoming to and outgoing from the airport. Without this building, there was no communication within the airport or from the airport to the outside world. There are banks of equipment still in place that show current and defunct airlines and terminals.

Page 40 states, "The building also has limited ornamentation reflecting economical design and avoiding an appearance of luxury as promoted by AT&T." The building's lack of overt or applied ornament is exactly in line with the Miesian design philosophy that was used in its design. The exposed concrete structural frame, solid brick infill partitions, modular plan and severe exterior appearance are all characteristics of Miesian architecture. The small lobby and main office are appointed with a well detailed storefront system and full-height glazed partitions, polished terrazzo floor, glazed terra-cotta walls and an ornamental dedicatory plaque. There are no interior public spaces because of the utilitarian nature of the interior functions. But from the exterior and lobby, it is exactly consistent with the overall Miesian design that Naess and Murphy used in the rest of the airport. Secondly, the avoidance of an appearance of luxury was only one of Bell's directives. It also wanted its buildings to be welcome additions to its surroundings, compatibility, and general economization. This building is an excellent and creative solution to those edicts. For its central offices, Bell wanted buildings that were strong, literally and figuratively, and that portrayed the technology and reliability of the company. This building does exactly that, with its unassailable appearance and clear visual communication of its brawny structure. Bell didn't skimp on its architecture, as evidenced by its commissioning Eero Saarinen in 1959 to design its laboratory in Holmdel, NJ. Companies did not hire Saarinen because they wanted an inexpensive, under-designed building. They hired him to provide creative, headline-making works of art, which is exactly what he provided at Homdel.

Page 46 states that central telephone offices were a common property type. While this is true, this building is not a common iteration for a central telephone office. No other, or very few other, central offices at the time looked like this building. Its lack of ornament is characteristic of its Miesian design. Page 46 says it is "one of many postwar examples that had little to no style or architectural ornamentation." The lack of ornamentation here is stylistic. And it is simply untrue that the building lacks style. Page 47 states that the building does not "appropriately reflect the work of Naess and Murphy in any manner that would represent a significant association with the architectural firm." This is not correct. This building precisely fits into the Miesian aesthetic that the firm embraced since its first Miesian commission, the Jardine Water Filtration Plant, whose design the firm started on in 1953. C.F. Murphy partner Carter Manny, in his oral history at the Art Institute of Chicago, said



that Stan Gladych brought Miesian design to the firm. Gladych designed Jardine, and we know he worked on O'Hare. The firm was fully steeped in Miesian design and the design espoused by the Illinois Institute of Technology by the time it was designing O'Hare and this building. Miesian influences continued at C.F. Murphy long after O'Hare was completed. The firm employed the same Miesian design philosophy for its 1970 AT&T switching station on Dorchester in Chicago. See attached article and:

[https://www.google.com/maps/place/6050+S+Dorchester+Ave,+Chicago,+IL+60637/@41.7845181,-87.5914271,3a,75y,264.19h,98.79t/data=!3m6!1e1!3m4!1sCRxv0cknU6CQy3H2\\_SfGaw!2e0!7i16384!8i8192!4m5!3m4!1s0x880e291a883c7f49:0x55132863657c1e1f!8m2!3d41.7845683!4d-87.5918744](https://www.google.com/maps/place/6050+S+Dorchester+Ave,+Chicago,+IL+60637/@41.7845181,-87.5914271,3a,75y,264.19h,98.79t/data=!3m6!1e1!3m4!1sCRxv0cknU6CQy3H2_SfGaw!2e0!7i16384!8i8192!4m5!3m4!1s0x880e291a883c7f49:0x55132863657c1e1f!8m2!3d41.7845683!4d-87.5918744). Instead of white brick, the firm used brown brick. While the O'Hare building has excellent integrity, Dorchester's integrity is less intact because its central windows were subsequently bricked in.

Page 47 continues that the building and garage have a "simplistic utilitarian design, lack ornamentation, and do not represent a distinctive or fully formed example of any architectural style." This is simply not correct. The straightforward design and lack of ornament, in addition to studied proportions, a pure cubic form, expressed concrete structure, solid brick infill panels, and a flat roof with no expressed parapet, are absolutely representative of a distinctive and fully formed architectural style. They are a direct embodiment of the design philosophies of Ludwig Mies van der Rohe, a design professor at the Illinois Institute of Technology, under whom many Murphy employees studied.

Anthony Rubano  
Deputy State Historic Preservation Officer  
Illinois State Historic Preservation Office  
Illinois Department of Natural Resources  
One Old State Capitol Plaza  
Springfield, Illinois 62701  
(217) 782-7459  
[anthony.rubano@illinois.gov](mailto:anthony.rubano@illinois.gov)

---

**From:** Hanson, Amy (FAA) <[Amy.Hanson@faa.gov](mailto:Amy.Hanson@faa.gov)>  
**Sent:** Thursday, December 19, 2019 3:33 PM  
**To:** Rubano, Anthony <[Anthony.Rubano@illinois.gov](mailto:Anthony.Rubano@illinois.gov)>  
**Cc:** Young, LaDonna <[LaDonna.Young@illinois.gov](mailto:LaDonna.Young@illinois.gov)>; Amy Squitieri <[amy.squitieri@meadhunt.com](mailto:amy.squitieri@meadhunt.com)>; dwasiuk@hmmh.com; Kurt M. Hellauer <[khellauer@hmmh.com](mailto:khellauer@hmmh.com)>; ORDTAP <[ORDTAP@hmmh.com](mailto:ORDTAP@hmmh.com)>; Wells, Patrick J (FAA) <[Patrick.J.Wells@faa.gov](mailto:Patrick.J.Wells@faa.gov)>; Basic, Catherine (FAA) <[Catherine.Basic@faa.gov](mailto:Catherine.Basic@faa.gov)>; Butler, Gail (FAA) <[gail.butler@faa.gov](mailto:gail.butler@faa.gov)>; DeLeon, Jose (FAA) <[Jose.DeLeon@faa.gov](mailto:Jose.DeLeon@faa.gov)>; Terry, Nan L (FAA) <[Nan.L.Terry@faa.gov](mailto:Nan.L.Terry@faa.gov)>; Aaron Frame <[Aaron.Frame@cityofchicago.org](mailto:Aaron.Frame@cityofchicago.org)>; Jamie Rhee <[Jamie.Rhee1@cityofchicago.org](mailto:Jamie.Rhee1@cityofchicago.org)>; Bartell, Deb (FAA) <[deb.bartell@faa.gov](mailto:deb.bartell@faa.gov)>; Christina Slattery <[christina.slattery@meadhunt.com](mailto:christina.slattery@meadhunt.com)>; Colleen Bosold <[Colleen.Bosold@meadhunt.com](mailto:Colleen.Bosold@meadhunt.com)>; Brad Rolf <[Brad.Rolf@meadhunt.com](mailto:Brad.Rolf@meadhunt.com)>  
**Subject:** [External] FAA response to SHPO notice of disagreement on the Determination of Eligibility for the O'Hare Telephone Building and Garage, Chicago O'Hare International Airport

Anthony,

The attached letter is being sent via US mail today, but I am sending you this electronic copy.

Thank you and Happy Holidays.

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration  
847-294-7354

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.



## Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271  
www.dnr.illinois.gov

JB Pritzker, Governor  
Colleen Callahan, Director

FAX (217) 524-7525

Cook County

Chicago

National Register Eligibility, O'Hare Telephone Building and Garage at O'Hare International Airport  
10000 W. O'Hare Ave.  
SHPO Log #011120219

March 16, 2020

Amy Hanson

U.S. Department of Transportation

Federal Aviation Administration

Chicago Airports District Office

2300 E. Devon Ave., Suite 201

Des Plaines, IL 60018

Dear Ms. Hanson:

Thank you for requesting comments from our office concerning the determination of eligibility for the O'Hare Telephone Building and Garage at O'Hare International Airport (SHPO Log #011120219). While this letter does not serve as a formal objection to the Federal Aviation Administration's consultant determination for the O'Hare Telephone Building and Garage, please find our comments below as required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

### Historic Relevance (Criterion A)

Though it predates the roll out of electronic switching in 1965, this building (1960-61) was critical to the operations of O'Hare, as the nerve center for ground-based airport communications. This significance is marked by Bell Telephone's allocation of \$4 million to it, which would equal about \$35 million in today's economy. The cost is a good indicator of the level of attention and technology this center was given. It contained the most current and advanced equipment that was available, several banks of which survive inside on the second floor. The technology was state of the art for 1961, even by military standards. The March 11, 1960 *Chicago Tribune* article "Plan 'Dial Anywhere' O'Hare Phone System" stated: "No other airport in the world will have a system exactly like O'Hare...O'Hare's new net will be like the newest military phone communications network."

An October 5, 1951 *Chicago Tribune* article ("O'Hare to Get Improved New Phone System") states: "That the new center will be an electronic marvel is proven by the service that is planned for the airport and surrounding territory, telephone company officials said. All subscribers, including air lines and



concessionaries at the huge field, will be served by a single control office and, thru an electronic relay system, it will be necessary to dial only four numbers for immediate connection to any telephone on the base from any other telephone on the base...The cost for calls from O'Hare to Chicago will drop from 15 to 10 cents each, resulting in a saving to the public and eliminating the need for an operator's assistance in such calls. The new building will not be served by overhead wiring but by lines placed in underground ducts within the airport property."

As the sole and dedicated communications center for the airport, it played a critical role in O'Hare's very function. All airline, terminal, gate, and concessionaire communication routed through this facility, as did all calls incoming to and outgoing from the airport. Without this building, there was no communication within the airport or from the airport to the outside world. There are banks of equipment still in place that show current and defunct airlines and terminals. Also, as an example of the expansion of O'Hare, it plays a significant role in the transportation history of the City of Chicago.

#### Architectural Relevance (Criterion C)

The building is an excellent example of Modernist architecture, as influenced by Ludwig Mies van der Rohe. Designed by Stan Gladych of the prominent architectural firm C.F. Murphy and Associates, its lack of overt or applied ornament is critical to its architectural design and aesthetic. It has an exposed-concrete structural frame, solid brick infill partitions, modular plan, and severe exterior appearance. The small lobby and main office were built with a detailed storefront system and full-height glazed partitions, polished terrazzo floor, glazed terra-cotta walls, and an ornamental dedicatory plaque. The Miesian design found throughout the airport is reflected in this utilitarian building; the appearance of efficiency and avoidance of applied ornament fit the directive of this type of architecture. This distinctive Miesian aesthetic is representative of C.F. Murphy in general, and Miesian influences continued in the firm's work long after O'Hare was completed.

Please feel free to call 217-782-4836 if you have any questions.

Sincerely,



Robert F. Appleman  
Deputy State Historic  
Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation  
Jamie Rhee, Commissioner, Chicago Department of Aviation

# **Determination of Eligibility: O'Hare Telephone Building and Garage**

## **Chicago O'Hare International Airport**

Prepared for the

**Federal Aviation Administration**

Prepared by



[www.meadhunt.com](http://www.meadhunt.com)

November 2019

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## Executive Summary

The historical evaluation of the O'Hare Telephone Building and Garage at O'Hare International Airport (O'Hare, or "the airport") supports Federal Aviation Administration (FAA) requirements for compliance with the National Environmental Policy Act (NEPA) and Section 106 regulations issued pursuant to the National Historic Preservation Act (NHPA), as amended (36 CFR Part 800). As part of its review of the City of Chicago's proposed Airport Layout Plan (ALP) modification, FAA is conducting a NEPA process for the proposed Terminal Area Plan (TAP) and other ALP modifications. In April 2019 FAA engaged Mead & Hunt, Inc. (Mead & Hunt), through a third-party contract, to complete a National Register of Historic Places (National Register) evaluation of the O'Hare Telephone Building.

The O'Hare Telephone Building and related Garage, designed by Naess & Murphy, are associated with telecommunications operations at O'Hare, and were completed in 1961. The O'Hare Telephone Building is owned by the Chicago Department of Aviation (CDA) and has been leased to the Illinois Bell Telephone Company, a subsidiary of AT&T, since the building's construction. The Garage was similarly leased to the Illinois Bell Telephone Company and AT&T, but it is no longer leased and is currently being used by the CDA. The O'Hare Telephone Building is two stories and square in plan, with a basement level and a flat roof. The Garage is approximately 135 feet north of the O'Hare Telephone Building and is one story in height, with a rectangular plan and flat roof.

The O'Hare Telephone Building and Garage were evaluated for National Register eligibility under *Criterion A: History, Criterion B: Significant Person(s), Criterion C: Architecture, or Criterion D: Information Potential*. The buildings do not individually or collectively possess significance under any of the criteria and are recommended as not eligible for listing in the National Register.



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## 1. Description

### A. Overall setting and context

Located in northeastern Illinois, Chicago O'Hare International Airport (ORD, also referred to as "O'Hare" or "the airport") occupies an approximately 8,200-acre site that straddles the Cook/DuPage County line to include areas within the city limits of Chicago, Des Plaines, Schiller Park, and Rosemont. The airport is sited approximately 17 miles northwest of Chicago's Central Business District and a variety of light industrial, commercial, residential, and public land uses surround the airport property. The airport itself consists of a central group of terminals (Terminals 1, 2, 3, and 5) encircled by taxiways and surrounded by runways (see Figure 1). Cargo facilities are located at southeast, southwest, and northeast portions of the airport. The general aviation facility is in the northeast corner of the airport, and fuel storage facilities are located at the northwest corner. Public surface parking areas are located along the central and northeast portions of the airport. The Federal Aviation Administration (FAA) North Control Tower is in the northwest corner of the property, while the FAA South Control Tower is located in the cargo facilities area on the southwest side of the airport. Other support facilities in the areas on the south, northwest, and northeast portions of the property include those for airline support and maintenance, aircraft rescue and firefighting, a post office, and Transportation Security Administration (TSA).

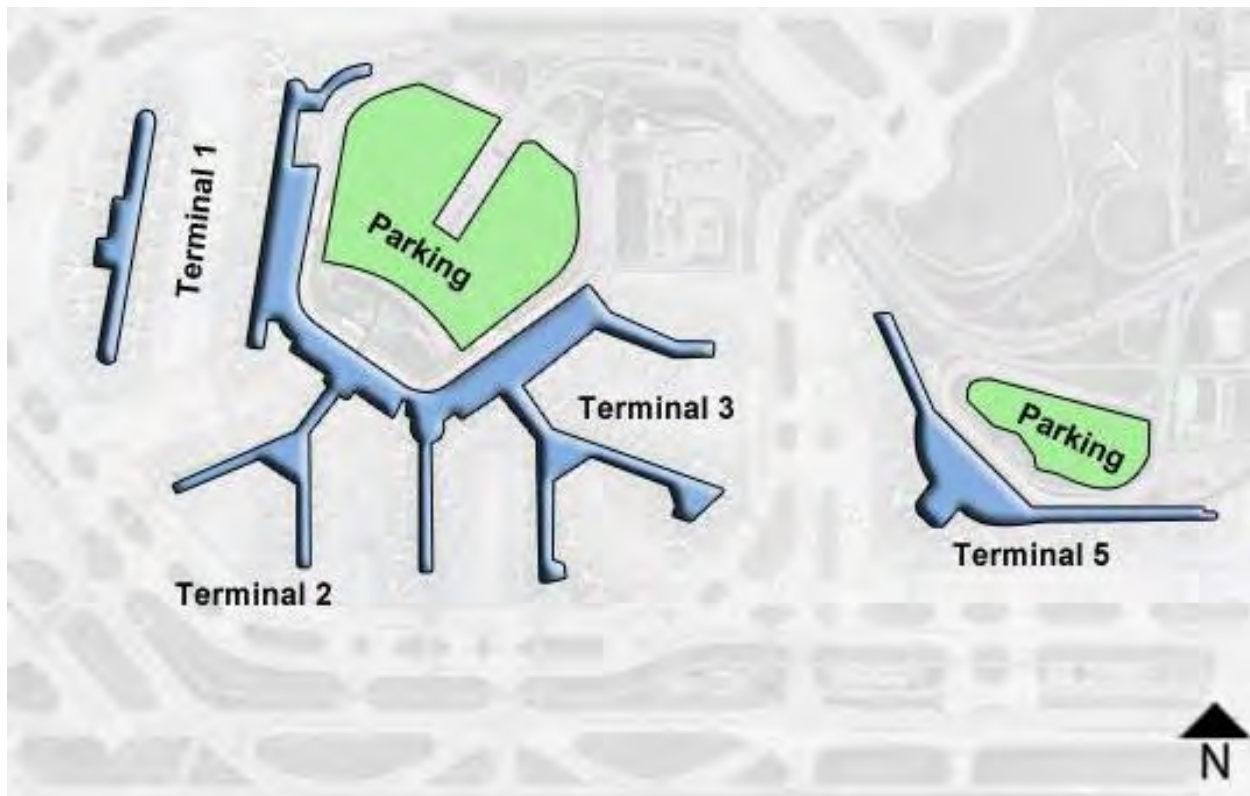


Figure 1. Map of terminals and parking areas at ORD.<sup>1</sup>

<sup>1</sup> "Chicago Ohare (ORD) Airport Terminal Map," *IFly.Com*, accessed June 5, 2019, <https://www.ifly.com/chicago-ohare-international-airport/terminal-map>.

## Section 1

### Description

At the center of the property, Terminals 1, 2, and 3 form the Terminal Core Area, arranged in a U-shaped plan that opens to the northeast. A utility and services area is located to the northeast of the Terminal Core Area, and consists of the Heating & Refrigeration Plant and cooling towers, an electric substation and associated buildings, and the subject O'Hare Telephone Building and Garage (see Figure 2). The interior of the U is occupied by two large parking lots, bisected by a central roadway that provides access to the Elevated Parking Building. Terminal 1 forms the west side of the U-plan. The O'Hare Hilton Hotel is located between the Elevated Parking Building and Terminal 2 (the base of the U), and the City of Chicago Department of Aviation (CDA) control tower (formerly a FAA control tower) is centered on a grassy plaza that separates the hotel from Terminal 2. The Rotunda links Terminals 2 and 3 at the southeast corner of the U, and the FAA Center Control Tower is located immediately adjacent. The outside of the U formed by Terminals 1 to 3 is occupied by a total of 168 contact gates and 15 remote hardstands.<sup>2</sup> Terminals 2 and 3 have concourses that extend onto the aprons in a perpendicular or Y shape, while Terminal 1 has a concourse (Concourse B) with gates along the west side of the main terminal building and a separate, parallel concourse (Concourse C) accessed via an underground tunnel.

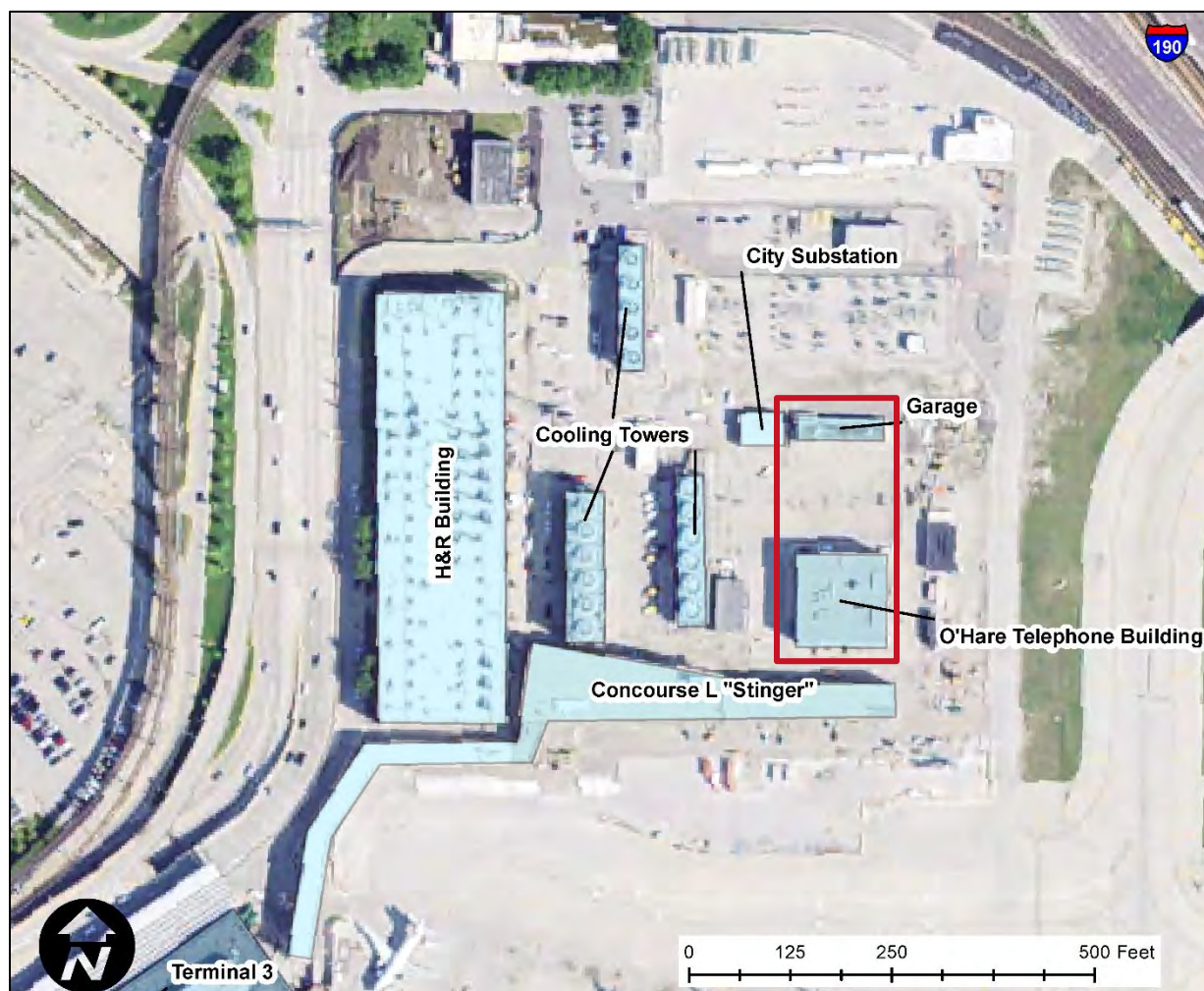


Figure 2. Map of utility and service buildings northeast of Terminal 3, with the O'Hare Telephone Building and Garage indicated in red.

<sup>2</sup> Aircraft parked at remote hardstand positions are accessed via shuttle bus rather than jet bridge.



Interstate Highway 190 (I-190) and the Chicago Transit Authority (CTA) O'Hare Rapid Transit Blue Line Rail Service enter the airport from the east. The Blue Line follows the central roadway to the parking area, where the O'Hare CTA Station is located below ground. The Airport Transit System (ATS, or "people mover") links the three domestic terminals, the international terminal, and the long-term parking area to the northeast by rail; the ATS is accessible via a transfer station from the Metra commuter rail service. Within the Terminal Core Area, the ATS tracks and a two-level vehicular circulation roadway separate the parking lot, garage, hotel, and CDA control tower from the terminals. The upper roadway level provides access to the ticketing area for departing passengers while the lower level provides access to the baggage claim and transportation for arriving passengers. ATS stations are located opposite each of the three terminals (as well as at Terminal 5) and are linked via covered pedestrian walkways across the roadway.

## **B. Overview of O'Hare Telephone Building**

The O'Hare Telephone Building and related Garage are associated with telecommunications operations at O'Hare, and were designed by Naess & Murphy and completed in 1961.<sup>3</sup> The O'Hare Telephone Building is owned by the CDA and has been leased to the Illinois Bell Telephone Company, a subsidiary of AT&T, since the building's construction. The Garage was similarly leased to the Illinois Bell Telephone Company and AT&T, but it is no longer leased and is currently being used by the CDA. The buildings are located approximately 0.15 miles northeast of the main terminal building at Terminal 3 in a utilitarian area of the airport that includes the Heating & Refrigeration Plant and associated cooling towers and electric substations.

The O'Hare Telephone Building is two stories and square in plan with a basement level and a flat roof. Principally constructed of reinforced concrete, the building's structural components are displayed in the exterior pattern of reinforced concrete column gridlines that surround blocks of non-bearing, infill, grey, glazed face brick laid in stretcher bond (see Figure 3). This repetitive pattern is broken by limited fenestration; where it occurs, door and window openings generally extend the entire height of each grid block. Two mechanical penthouses clad in metal louver vents and various mounted mechanical equipment project above the roofline. A concrete curb with metal grates surrounds the building at grade, providing ventilation and exterior access to mechanical equipment located within the basement. The dimensions of the O'Hare Telephone Building are approximately 110 feet by 110 feet.

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<sup>3</sup> Various names are associated with this building. This description refers to the building as the O'Hare Telephone Building, as it was dedicated as such in 1961 and commemorated with a plaque located in the building's lobby (see Figure 16). The O'Hare Telephone Building is CDA building number 464 and the former associated Garage is CDA building number 466.



*Figure 3. South and east elevations of the O'Hare Telephone Building, facing northwest.*

The east elevation is the building's principal facade and it is distinguished from the other elevations by a vertical two-story bay of three tinted window panels located within the central grid blocks (see Figure 4). The building's main entry occupies the entire lower grid block within this central bay and consists of a set of metal framed glazed double doors surrounded by vertically oriented tinted windows. The entry is accessible via a landing flanked by a set of poured-concrete stairs and an accessible ramp. Above the entry is a grid block at the second level that also exhibits the three vertically oriented tinted windows. Signage affixed to the northern corner of the east elevation displays the "464" building number.



*Figure 4. Detail of vertical bay of tinted windows and main entry to O'Hare Telephone Building at east elevation, facing southwest.*

Side entries at the south, west, and north elevations all consist of metal slab doors with opaque, metal transoms above, each accessible via metal-frame stairs. Two sets of large utility double-doors with metal transoms are centered on the north elevation within the upper and lower grid blocks (see Figure 5). The side elevations lack windows except for a single window centered on the west elevation at the second story that exhibits an opaque metal transom and bulkhead (see Figure 6).



*Figure 5. North elevation of the O'Hare Telephone Building, view facing southwest.*



*Figure 6. West elevation of the O'Hare Telephone Building, view facing southeast.*



Mechanical equipment is located on the concrete curb to the north of the side entry at the west elevation and is surrounded by a metal chain-link fence and four bollards. Two cylindrical metal stacks adjacent to the building extend in height above the roofline on the south elevation (see Figure 7). One of the stacks is affixed to the exterior and projects from the lower-level exterior of the building, while the other stack projects vertically from the curb that surrounds the building and is not affixed to the exterior. There are remnants of a metal chain-link fence projecting from the eastern corner of the south elevation that appears to have previously screened mechanical equipment, given the extant fence that serves this purpose at the west elevation.



*Figure 7. South elevation of the O'Hare Telephone Building, showing side entry and two cylindrical stacks.*

The exterior appears to have experienced only minor modifications over time. This includes replacement glazed face bricks located in four areas: the three lowest courses of bricks within the upper-left grid block and lower-left grid blocks at the east elevation, and the three lowest courses of bricks within the upper-right and lower-right grid blocks at the south elevation (see Figure 8). The replacement bricks have a similar shape to the grey face bricks but are white in color.



*Figure 8. Detail of areas at the south and east elevations that exhibit courses of replacement exterior bricks, view facing northeast.*

The interior of the O'Hare Telephone Building consists of two floors and a basement level, which are connected by stairwells at the northeast and southeast corners of the building (see Figure 9 through Figure 11). There are both equipment and non-equipment rooms, which are all accessible via north-south linear circulation corridors that span the length of the building at each floor (see Figure 12 and Figure 13). These corridors are similar in appearance, with the upper-level wall materials consisting of load-bearing glazed tile and the lower level consisting of concrete masonry units. Due to security reasons, it was prohibited to document specific operational equipment with photographs.



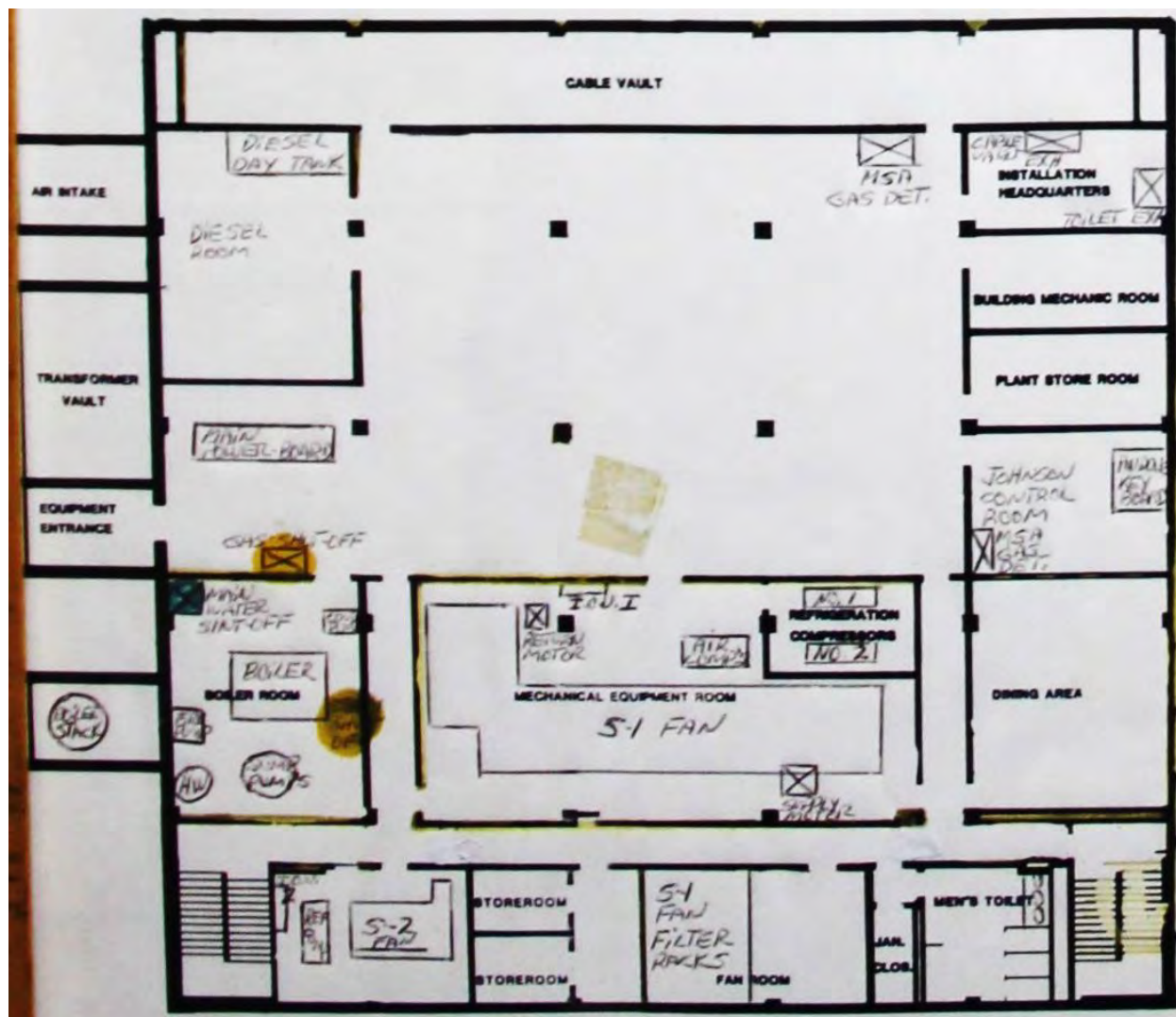


Figure 9. Plan of the basement level (west is up) from a map of critical building equipment mounted in the first-floor corridor

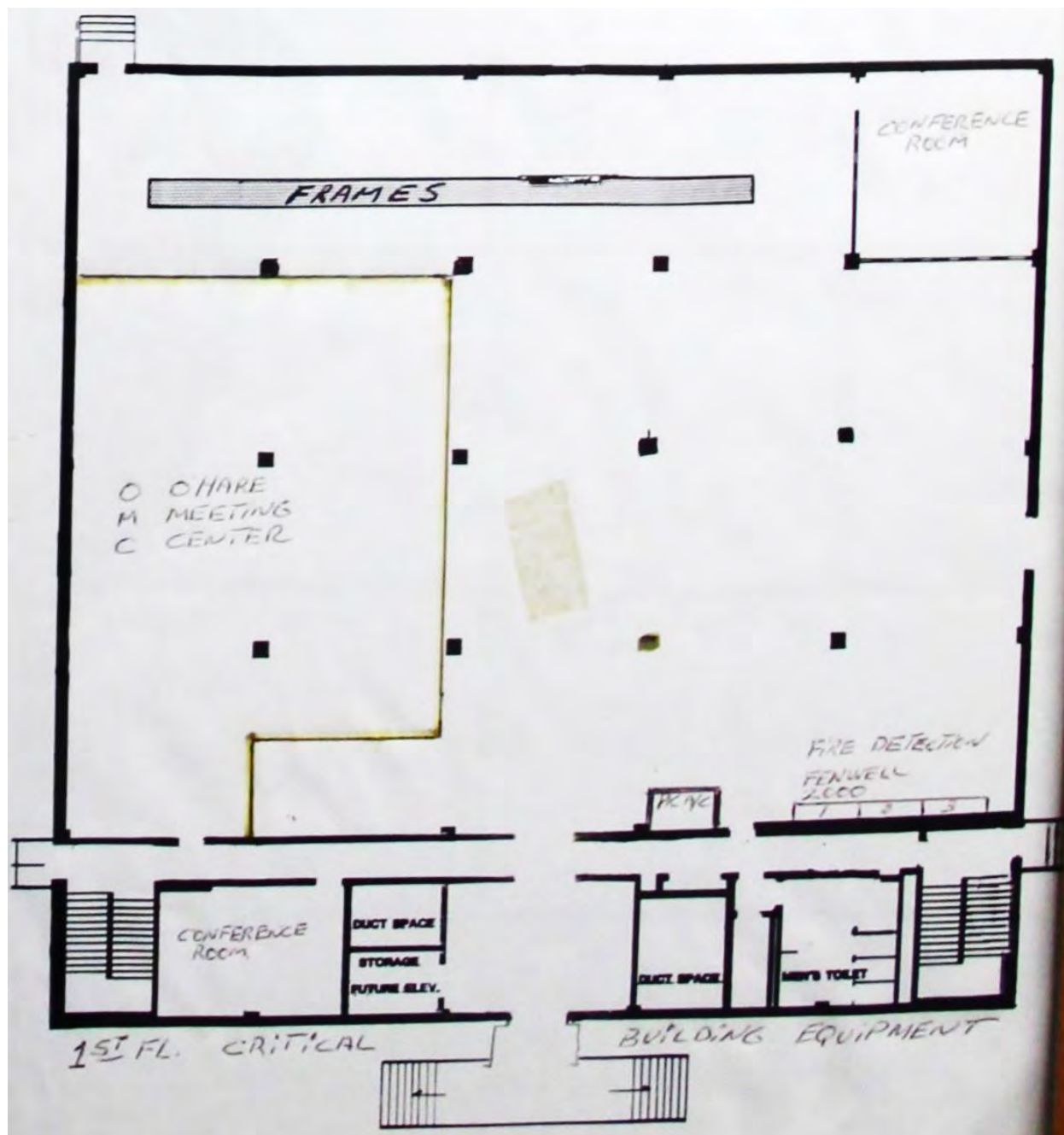


Figure 10. Plan of the first floor (west is up) from a map of critical building equipment mounted in the first-floor corridor

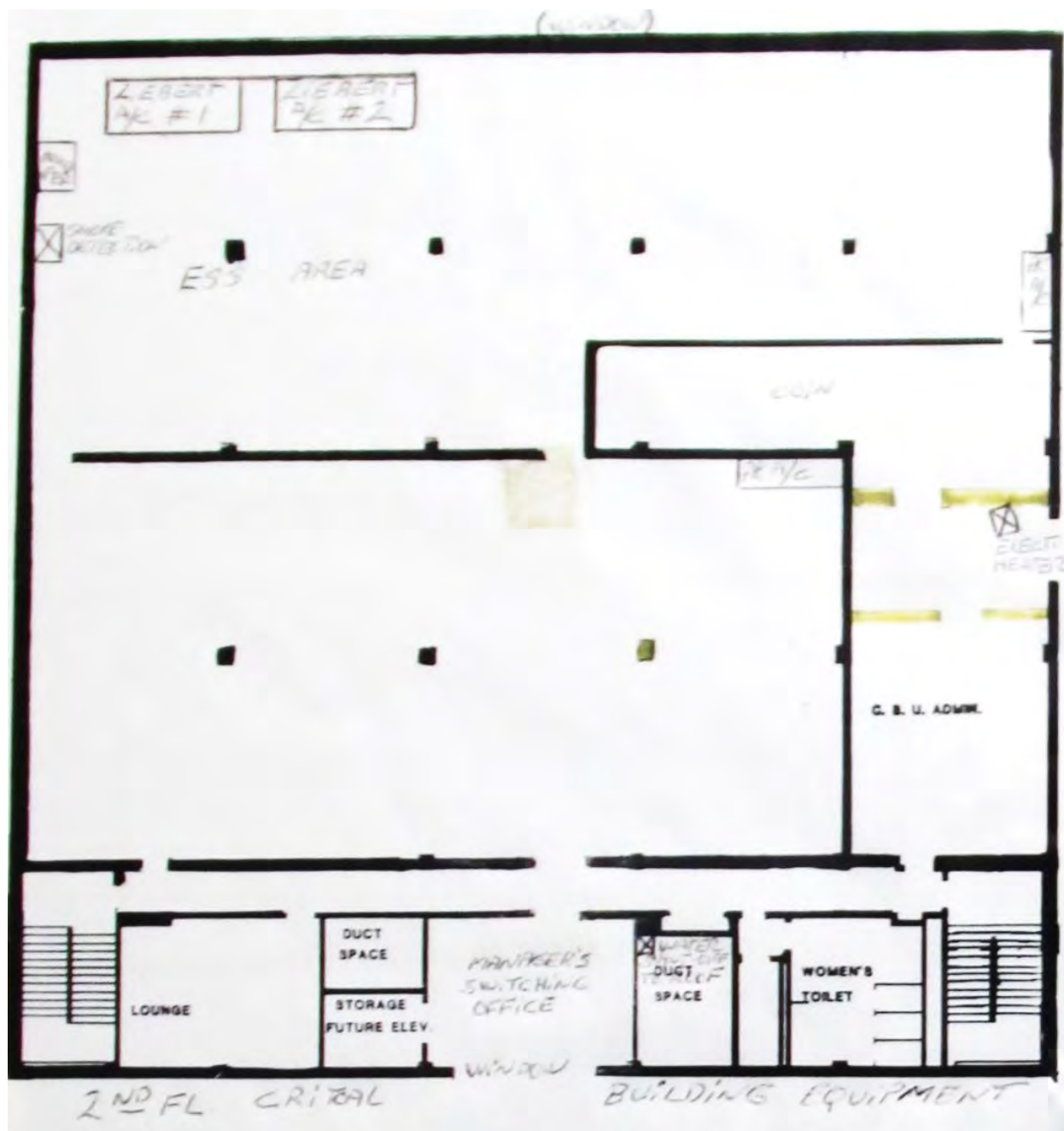


Figure 11. Plan of the second floor (west is up) from a map of critical building equipment mounted in the first-floor corridor.





*Figure 12. Corridor on the first floor.*



*Figure 13. Typical interior stairwell.*

The main entry to the O'Hare Telephone Building leads to the lobby, which is dominated by the wall of windows within the lower grid block of the east elevation's central vertical bay. Interior finishes in the lobby consist of white glazed tile interior walls that are load-bearing, grey terrazzo tile flooring, metal grating ceiling tiles set within T-bars, and metal interior doors that are painted blue (see Figure 14 and Figure 15). There is a dedication plaque affixed to an interior wall that was likely installed upon the building's completion in 1961 (see Figure 16). The lobby leads directly to the corridor, which provides access to various conference rooms, toilet rooms, and equipment rooms and other utility-oriented rooms.



*Figure 14. Lobby interior showing tinted windows and main entry at the east elevation.*





*Figure 15. Lobby interior.*



*Figure 16. Dedication plaque at the interior wall of the lobby.*

The largest room in the first story is the mainframe room, which encompasses approximately half of the first-story floor area and holds various mechanical equipment related to the telecommunications operations of the building (see Figure 17). Square columns are located throughout the space, with interior finishes that include asbestos tile flooring, glazed tile walls, and what appears to be a gypsum board ceiling.



*Figure 17. Mainframe room.*

Various non-equipment rooms are located throughout the first floor, including conference rooms and toilet rooms. The conference rooms exhibit the same glazed tile walls as the corridors, in addition to gypsum board walls, carpet flooring, and T-bar ceilings (see Figure 18). Toilet rooms have glazed tile walls and grey square tile flooring.



*Figure 18. Typical conference room interior.*

The second-floor layout is similar to the first floor in terms of spatial arrangement with a north-south corridor that leads to the building's two interior stairwells (see Figure 19). The rooms on the second floor consist of a lounge, engineer's office, toilet rooms, storage rooms, and an equipment room. The equipment room encompasses the majority of the floor area and houses operational mechanical equipment, desks with computer systems, and other areas dedicated to various defunct telecommunications equipment that is no longer in use (see Figure 20). Square columns are throughout the space along with finishes that consist of painted concrete masonry units, asbestos tile flooring, and a gypsum board ceiling. Several interior metal slab doors provide access to rooms along the outer edges of the equipment room.





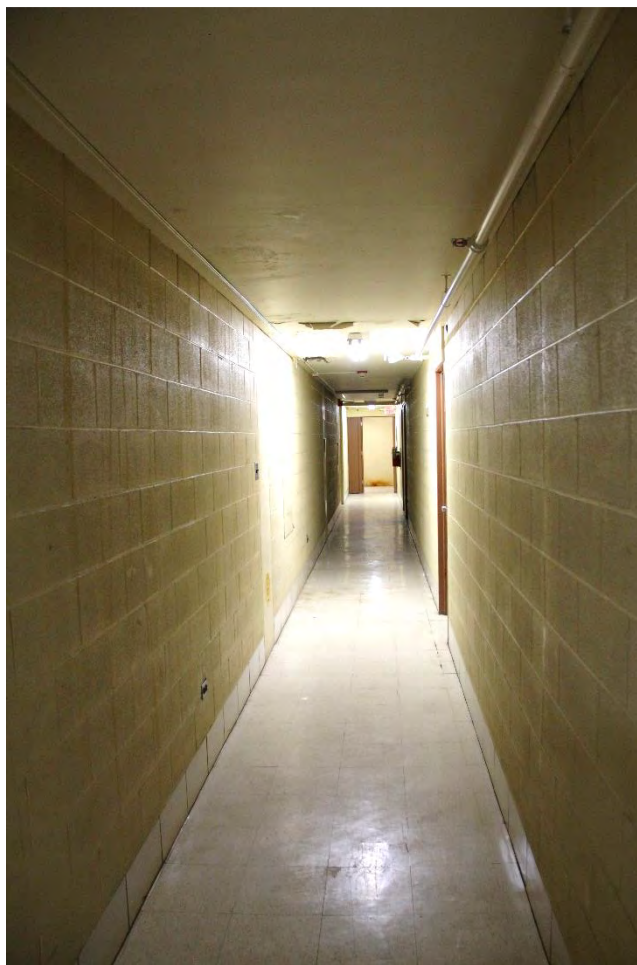
*Figure 19. Corridor on the second floor.*



*Figure 20. Desk in the equipment room on the second floor.*



The basement consists of a similar spatial arrangement as the upper floors, with a north-south corridor that leads to the building's two interior stairwells (see Figure 21). The basement corridor is distinct from the first and second floors in that it exhibits painted concrete masonry unit walls rather than the typical white glazed tile. Rooms in the basement consist of a power and service board area, cable vault, fan rooms, toilet rooms, boiler room, storage rooms, and employee lounge. The power and service board area is the largest room in the basement and includes back-up power supplies, a diesel generator, and various other equipment to facilitate the telephonic communications services of the airport (see Figure 22 through Figure 24). This room has square columns throughout, with interior finishes consisting of painted concrete masonry unit walls, asbestos tile flooring, and a ceiling with various suspended lighting and mounted metal conduits that lead to mechanical equipment around the room.



*Figure 21. Corridor in the basement level.*



*Figure 22. Power and service board area in the basement level.*



*Figure 23. Power and service board area in the basement level.*



*Figure 24. Diesel generator in the basement level.*

### **C. Overview of O'Hare Telephone Building Garage**

The Garage associated with the O'Hare Telephone Building was also designed by Naess & Murphy and completed in 1961. The building is located within the utilitarian area to the northeast of the Terminal Core. The Garage is approximately 135 feet north of the O'Hare Telephone Building. It is the same width as the O'Hare Telephone Building, with dimensions that consist of 110 feet by 28 feet.

The Garage is one story in height and rectangular in plan with a flat roof. The building has five bays with sectional garage doors at its front (south) elevation and is constructed of reinforced concrete in a manner that is identical to the O'Hare Telephone Building (see Figure 25 and Figure 26). Overall, the Garage also shares exterior design elements with the O'Hare Telephone Building, mainly in the form of the grid-block pattern, where grid blocks of grey glazed face brick are non-bearing infill set within reinforced-concrete column grid lines. Also similar to the O'Hare Telephone Building are the side entry openings at the Garage, which consist of metal slab doors with opaque metal transoms that extend the full height of the grid block.





*Figure 25. South and east elevations of the Garage.*



*Figure 26. West and south elevations of the Garage.*

The south elevation consists of five bays of metal-frame sectional garage doors, each with multi-light glazing. For ease of understanding, the bays are numbered in this description as 1-5, from west to east. The glazing within the multi-light garage doors is opaque at the lower five rows and transparent in the top row (see Figure 27). The fifth bay door slightly deviates from this rule, with a cluster of four lights in the second and third rows from the top that are transparent. The opaque glazing at all five doors varies slightly in color, but all panes appear to exhibit a white or light-turquoise color. Painted metal bollards protect the bases of columns between each bay and at the building's southwest and southeast corners.





*Figure 27. Detail of the first-bay garage door at the south elevation, facing north.*

The building's west and east elevations are nearly identical in appearance, with a grey face brick grid block surrounded by concrete column gridlines, and a side entry door with transoms centered within the grid block (see Figure 28). The side entry doors at these elevations are metal slab doors, with a replacement door at the west elevation that displays a metallic sheened finish. The north elevation is nearly identical in design composition to the exterior of the O'Hare Telephone Building, exhibiting five grid blocks of brick surrounded by concrete column gridlines. This north elevation does not exhibit any fenestration.



*Figure 28. East and north elevations of the Garage.*

The interior of the Garage has poured-concrete flooring, with most interior walls clad in glazed structural tiling. This utilitarian space is generally open through the first and second bays, with metal shelving and other items stored within the area (see Figure 29). These two bays are separated from the third bay by a metal chain-link fence with razor wire that extends the width of the interior (see Figure 30). A concrete masonry wall partially separates the third bay from the fourth bay, but the wall does not extend the entire width of the interior (see Figure 31). The fifth bay is entirely enclosed (see Figure 32) and is accessed via three openings: the side entry at the east elevation, the garage door, or an interior door that leads from the interior of the fourth bay. The ceilings are concrete throughout the interior.



*Figure 29. Interior of the Garage showing the space behind the first bay.*



*Figure 30. Detail of the chain-link fence with razor wire that separates the second bay from the third bay.*





*Figure 31. View through the chain-link fence showing the concrete masonry unit wall that partially separates the third bay from the fourth bay.*



*Figure 32. Interior of the fifth bay.*



## 2. Statement of Significance

### A. History of O'Hare International Airport

The first municipal airport to serve the city of Chicago was Chicago Municipal Airport, later renamed Midway Airport, which opened in 1927 on the southwest edge of the city. Due in part to Chicago's central location within the country, passenger traffic at Chicago Municipal increased over 600 percent between 1931 and 1943. By the early 1940s the airport was operating well beyond its capacity. While Chicago's location within the country was a boon to business, the airport's location within the city was not. Surrounded by growing neighborhoods, Chicago Municipal had no room to grow. The need for more space to accommodate the ever-growing number of passengers and larger aircraft prompted the City of Chicago (City) to search out a location for a new airport.<sup>4</sup>

The development of O'Hare International Airport (O'Hare or "the airport") began in 1942 when the federal government purchased 1,000 acres near the hamlet of Orchard Place on the northwest outskirts of Chicago, which it leased to Douglas Aircraft (Douglas) to build and operate a factory constructing troop transports during World War II. The Douglas factory closed its doors at the end of the war, but the expanded facilities and potential for future growth made Orchard/Douglas Field an ideal site for the City to build a new and larger airport (see Figure 33). The federal government donated the airport property to the City, and the first commercial flights at Orchard/Douglas Field began in 1946. The airport was renamed Chicago O'Hare International Airport in 1949 in honor of the Chicago-born pilot Edward H. "Butch" O'Hare, who had been shot down in the Pacific during World War II. The village of Orchard Place was eventually absorbed by the expanding airport, but its legacy lives on in the airport identifier for O'Hare, ORD.<sup>5</sup>

Plans were quickly drafted to develop O'Hare into a major international airport that could support the increasing demand at Midway and in the region. City planner Ralph H. Burke drafted O'Hare's first master plan in 1948; however, it was not until 1956 that a terminal (the original Terminal 1) was completed.<sup>6</sup>

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<sup>4</sup> David Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," in *Chicago Architecture and Design 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: The Art Institute of Chicago and Perstel-Verlog, 1993), 80–83.

<sup>5</sup> Richard P. Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)* (Muncie, IN: Ball State University, 1970), 9–11, 27; Anne Royston, "Chicago-O'Hare International Airport," in *AIA Guide to Chicago* (San Diego, New York and London: Harcourt Brace, 1993), 262.

<sup>6</sup> Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," 85–86; Royston, "Chicago-O'Hare International Airport," 262; "The Fascinating History of Chicago's O'Hare International Airport 1920-1960," *Airways*, April 7, 2014, <https://airwaysmag.com/2014/04/07/chicago-ohare-history/>.



Figure 33. Overview of the locations and relative size of Midway Airport (Chicago Municipal Airport) and the proposed O'Hare (Orchard Place/Douglas Field) facilities in relation to the city of Chicago, 1948.<sup>7</sup>

<sup>7</sup> Ralph H. Burke, *Master Plan of Chicago Orchard (Douglas) Airport* (Prepared for City of Chicago, January 1948), 21, available in Transportation Library Digital Collections: Chicago O'Hare International Airport, <https://archive.org/details/masterplanofchic00burk>, Northwestern University Transportation Library.

## Statement of Significance

Following the construction of the first terminal, new jet liners introduced in the late 1950s revealed shortcomings of Burke's initial plan. New aircraft such as the Boeing 707 and Douglas DC-8 not only carried twice as many passengers as earlier commercial aircraft but required longer runways and more space at the terminal gates to accommodate wider wingspans. In 1955 Mayor Richard Daley commissioned the architectural firm Naess & Murphy, renamed C.F. Murphy Associates (C.F. Murphy) in 1960, to review Burke's original plan and build upon it with larger terminals and greater automobile access. C.F. Murphy partnered with the Cincinnati-based firm Landrum & Brown to complete the new airport design.<sup>8</sup>

Terminals 2 and 3 were completed in 1961 and officially opened in 1962 (see Figure 34). The Rotunda building, built between the two terminals, was completed in 1962. The original Terminal 1 building then became the airport's international terminal. The new airport design also included support and service-oriented buildings, consisting of hangar and cargo facilities and several service-oriented buildings, including the Heating & Refrigeration Building and a single cooling tower. The O'Hare Telephone Building and Garage were completed in 1961 to handle telecommunication needs at the airport. Although not included in the original 1958 plan, they were part of the same era of airport expansion and growth.<sup>9</sup>



Figure 34. View of Terminal 2, designed by C.F. Murphy, at night, 1962.<sup>10</sup>

<sup>8</sup> Royston, "Chicago-O'Hare International Airport," 262–63; Leonard R. Bachman, *Integrated Buildings: The Systems Basis of Architecture* (Hoboken, N.J.: John Wiley & Sons, 2003), 220; *Airport Cooperative Research Program Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook* (Washington, D.C.: Transportation Research Board, 2010), 6; Michael Branigan, *A History of Chicago's O'Hare Airport* (Charleston, S.C.: The History Press, 2011), 82, 86.

<sup>9</sup> Royston, "Chicago-O'Hare International Airport," 262–63; Bachman, *Integrated Buildings: The Systems Basis of Architecture*, 220; *Airport Cooperative Research Program Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook*, 6; Branigan, *A History of Chicago's O'Hare Airport*, 82, 86.

<sup>10</sup> Kori Rumore, "From Farmland to 'Global Terminal': A Visual History of O'Hare International Airport," *Chicago Tribune*, March 27, 2019, <https://www.chicagotribune.com/news/ct-ohare-international-airport-development-history-timeline-htmlstory.html>.

In 1962, following the completion of Terminals 2 and 3, operations at Midway Airport were transferred to O'Hare, which soon became, and has remained, one of the busiest airports in the United States.<sup>11</sup> Every major American city could be reached from Chicago on relatively short flights, which established O'Hare as a primary location for connecting flights across the country.<sup>12</sup> The fact that O'Hare had been specifically designed to accommodate the jet liners of the 1950s and 1960s added to its importance as a major airport.<sup>13</sup> Further improvements to O'Hare completed in the early 1970s included a new control tower, an airport hotel and parking garage.

O'Hare's importance as a connecting airport increased following the Airline Deregulation Act of 1978. Among other facets, the legislation allowed airlines to establish hubs at specific airports by trading and sharing routes. While Trans World Airlines (TWA) and other airlines had established small hubs previously, the phenomenon took off in the early 1980s. Delta Airlines built a large hub in Atlanta, American Airlines focused its hub at Dallas-Fort Worth, and United Airlines established its major hubs at O'Hare and Denver's Stapleton Airport.<sup>14</sup>

In 1982 the Chicago Department of Aviation (CDA) launched the O'Hare Development Program (ODP) to expand O'Hare's capacity by 1995. The plan included a new Terminal 1 building, expansion of Terminals 2 and 3, building a new international terminal (Terminal 5), and a "people mover" to transport travelers to more distant parking areas (see Figure 35).<sup>15</sup>

<sup>11</sup> The transfer of operations from Midway was temporary as flights returned to Midway in 1964. "Chicago Department of Aviation | O'Hare and Midway International Airports," *Midway History*, accessed July 31, 2019, <https://www.flychicago.com/business/CDA/Pages/Midway.aspx>.

<sup>12</sup> Joseph P. Schwieterman, *Terminal Town: An Illustrated Guide to Chicago's Airports, Bus Depots, Train Stations, and Steamship Landings, 1939-Present* (Lake Forest, Ill.: Lake Forest College Press, 2014), 2.

<sup>13</sup> "Chicago O'Hare International Airport, Crossroads of the World," *Chicago Tribune*, April 7, 1963, sec. 7A: Your Chicago Today.

<sup>14</sup> Bachman, *Integrated Buildings: The Systems Basis of Architecture*, 220; "The Fascinating History of Chicago's O'Hare International Airport 1920-1960"; "Chicago O'Hare Airport Becomes America's Busiest Airport Again," *International Airport Review*, February 6, 2019, <https://www.internationalairportreview.com/news/80867/ohare-americas-busiest-airport/>.

<sup>15</sup> "The Fascinating History of Chicago's O'Hare International Airport 1920-1960"; Robert Davis, "United Plans \$100 Million New Terminal at O'Hare," *Chicago Tribune*, September 20, 1980; David Young, "United Plans New O'Hare Terminal," *Chicago Tribune*, December 10, 1982; John Camper, "O'Hare Project Picks up: Expansion Enters Peak Year of Construction," *Chicago Tribune*, March 1, 1987; O'Hare Associates, "Progress Report, Chicago-O'Hare International Airport Development Program, June 1984," 1; Gary Washburn, "World at City's Doorstep as New O'Hare International Terminal Takes Wing," *Chicago Tribune*, May 28, 1993.



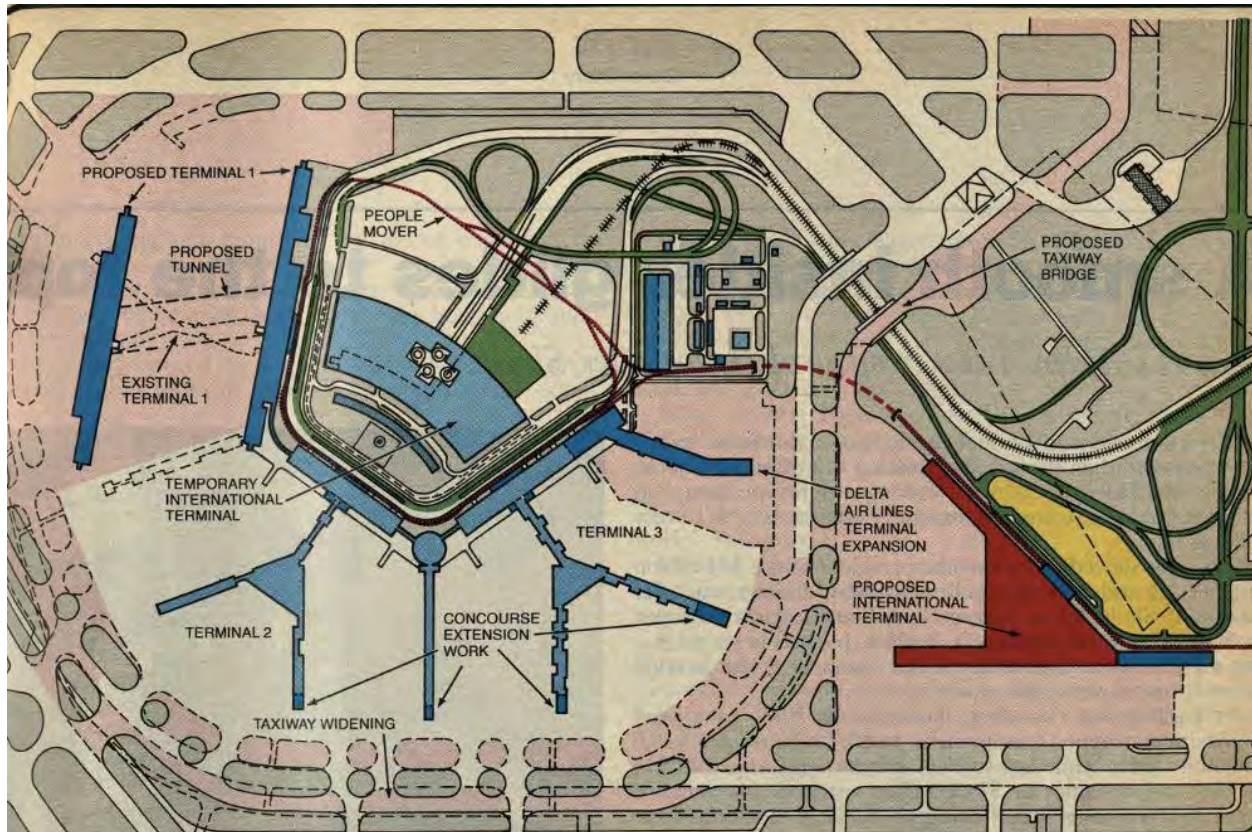


Figure 35. Overview of O'Hare Development Program, 1984.<sup>16</sup>

## B. Historic background of the Bell System, Illinois Bell Telephone Company, and telephone technology

The O'Hare Telephone Building was built by the Illinois Bell Telephone Company, which was part of the well-established Bell System, a network of telephone companies created in 1900 but with roots dating back to the invention of the telephone. This section discusses the history of telephone service and technology to offer context for the services provided by the O'Hare Telephone Building.

Alexander Graham Bell is credited with inventing the first telephone. Through experimentation with harmonic telegraph instruments, Bell and his assistant Thomas Watson transmitted sound using electricity for the first time in 1875 and the following year succeeded in transmitting intelligible words.<sup>17</sup> The principal idea behind his invention was that waves of electricity can have the same pattern as the waves of air humans set in motion when they speak. Bell obtained financial backing for his experiments from Thomas Sanders and Gardiner Hubbard and proceeded to exhibit his invention at the Philadelphia Centennial celebration in June 1876. However, the public was not initially interested. Bell obtained a patent in 1876 and continued to give talks and demonstrations. Interest grew, and in 1877 the first

<sup>16</sup> "O'Hare Airport Expansion Takes Off," *Engineering News-Record* 212, no. 19 (May 10, 1984): 27.

<sup>17</sup> Bell Telephone System, *The Telephone in America*, 1952, 29–31, [https://beatriceco.com/bti/porticus/bell/pdf/the\\_telephone\\_in\\_america\\_1952.pdf](https://beatriceco.com/bti/porticus/bell/pdf/the_telephone_in_america_1952.pdf).

telephones dedicated to commercial activities were put into use.<sup>18</sup> In May 1877 the first telephone switchboard was installed in a Boston office using the wires of a burglar alarm system to connect four banks and a manufacturing business via telephone; no technology existed for connecting more than two phones before this time. The first commercial switchboard was installed in New Haven, Connecticut, just one year later whereby operators connected various plugs, jacks, and keys to put the calls through to the desired destination or individual.<sup>19</sup> The number of lines and customers served by a single switchboard continually expanded from this point forward.<sup>20</sup>

In July 1877 Bell, Watson, Sanders, and Hubbard formed the Bell Telephone Company whereby they leased telephones to customers through a system of licenses distributed to authorized agents across the nation. Their intention was to expand commercial use of the telephone. These license-agencies developed into what later became telephone exchanges (essentially the network of cables, instruments, and switching equipment that provided telephone service to a specific local geographic area), and then local Bell telephone companies across the nation. One such local company was the Illinois Bell Telephone Company.<sup>21</sup>

The Illinois Bell Telephone Company incorporated in 1878 and brought the telephone to Chicago. The new company was led by Hubbard, one of Bell's initial investors. Demand for telephones continued to grow and over the course of several years, telephone companies consolidated to gain capital and expand their reach. Between 1879 and 1880 the Bell Telephone Company merged with the New England Telephone Company to form National Bell Telephone, which was subsequently reorganized as the American Bell Telephone Company in 1880. The Chicago Telephone Company incorporated in 1881 and within a year merged with the Bell Telephone Company of Illinois to create the Illinois Bell Telephone Company.<sup>22</sup>

### (1) Establishment of AT&T

The American Telephone and Telegraph Company (AT&T) formed in 1885 with the goal of operating long-distance lines to link the local and regional telephone companies that had developed out of the original licenses distributed by the Bell Telephone Company. Long distance lines reached Chicago by 1892.<sup>23</sup> By 1899, 110 cities and towns within 40 miles of Chicago were connected to the Chicago telephone exchange, enabling business transactions between firms in the city without parties being face-

<sup>18</sup> Bell Telephone System, *The Telephone in America*, 29–31; Bell Telephone System, *The Magic of Communication*, 1953, 5, [https://beatriceco.com/bti/porticus/bell/pdf/the\\_magic\\_of\\_communication\\_1953.pdf](https://beatriceco.com/bti/porticus/bell/pdf/the_magic_of_communication_1953.pdf).

<sup>19</sup> Walter MacNair Vice President of Transmission and Switching Development, Bell Laboratories, "Electronic Switching," *Bell Laboratories Record* 43, no. 6 (June 1965): 194–95.

<sup>20</sup> Bell Telephone System, *The Telephone in America*, 32; *Switchboards, Old and New (Bonus Edition)* (A Bell System Film, produced by Loucks and Norling Studios, 1932), <https://www.youtube.com/watch?v=xJ1fKFqt7qU>.

<sup>21</sup> Bell Telephone System, *The Telephone in America*, 1952, 3, 31; American Telephone and Telegraph Company, *Things Worth Knowing About the Telephone* (New York: Information Department, American Telephone and Telegraph Company, 1929), 7–8, 15, [https://beatriceco.com/bti/porticus/bell/pdf/things\\_worth\\_knowing\\_about\\_the\\_telephone\\_1929\\_1.pdf](https://beatriceco.com/bti/porticus/bell/pdf/things_worth_knowing_about_the_telephone_1929_1.pdf).

<sup>22</sup> *A Golden Anniversary, 1878-1928: The Story of Fifty Years of The Bell Telephone in Chicago* (Chicago: Illinois Bell Telephone Company, 1928), 11.

<sup>23</sup> Bell Telephone System, *The Telephone in America*, 13.

to-face.<sup>24</sup> One of the most consequential consolidations for the telecommunications industry came in 1899, when AT&T absorbed the American Bell Telephone Company and became the parent company of the national network of local Bell telephone companies, including the Illinois Bell Telephone Company.<sup>25</sup>

The Bell System eventually consisted of AT&T, Western Electric Company, Bell Telephone Laboratories, and over 20 Bell System subsidiary telephone companies across the nation. Western Electric Company and Bell Telephone Laboratories functioned as manufacturing and research arms of the broader Bell System; both continually conducted research and developed and distributed new telephonic services and technologies to local Bell telephone company facilities across the nation.<sup>26</sup>

AT&T consolidated its market share throughout the 1920s and 1930s, purchasing exchanges serving more than 114,000 customers in 1921 and completing 271 mergers. By the end of the 1920s AT&T held 80 percent of the market share and was the major telephone service provider nationwide.<sup>27</sup> The onset of the Great Depression led to a decline in the number of telephones, but experiments with switching and transmission systems that were part of the war effort during World War II led to later improvements for public and private telephone systems.<sup>28</sup> The post-World War II (postwar) era saw the highest demand for telephone service ever, and the Bell System continued to expand and introduce new services for its individual and business customers.<sup>29</sup>

## (2) Evolution of switching technologies

Switching equipment, which made possible the connection of calls since the early days of telephones, was installed in telephone buildings across the nation throughout the twentieth century. The evolution of switching equipment can be broken down into three major phases: manual switching, mechanical switching, and electronic switching. With the introduction of each new switching technology, local Bell telephone companies across the nation typically kept at least some of the previous equipment as backup and to accommodate any customers needing operator assistance or that did not have the latest in telephone technology. The phases of switching are briefly described below to provide context for understanding the evolution of the equipment inside the O'Hare Telephone Building.

Manual switching was in use from the late nineteenth century through the early to mid-1920s. This switching technology involved operators connecting calls by hand at a switchboard using various plugs,

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<sup>24</sup> "Don't Travel - Telephone," *Chicago Tribune*, January 21, 1899.

<sup>25</sup> "AT&T's History of Inventions and Breakups," *New York Times*, February 13, 2016, <https://www.nytimes.com/interactive/2016/02/12/technology/att-history.html>.

<sup>26</sup> Bell Telephone System, *The Telephone in America*, 10–11.

<sup>27</sup> Susan E. McMaster, *The Telecommunications Industry* (Westport, Conn.: Greenwood Press, 2002), 52; Daniel Prosser, *Los Angeles Citywide Historic Context Statement: Public and Private Institutional Development/Communications/Telephone History and Development*, Survey LA: Los Angeles Historic Resources Survey (Los Angeles, Calif.: City of Los Angeles, Department of City Planning, Office of Historic Resources, April 2018), 9.

<sup>28</sup> Illinois Bell Telephone Company, *75th Anniversary of the Telephone in Illinois* (Chicago: Illinois Bell Telephone Company, 1953), 3.

<sup>29</sup> Bell Telephone System, *The Telephone in America*, 6.

jacks, and keys to put a call through to a desired destination or individual.<sup>30</sup> The caller provided the operator the name of the desired telephone exchange followed by a four-digit number, which corresponded to the actual phone they were calling.<sup>31</sup>

The next phase was mechanical switching. By 1929 the Bell System had begun introducing this technology to promote growth and replace worn-out equipment. Mechanical switching replaced the operator with an electronic switchboard apparatus that mechanically performed what operators had previously done at the manual switchboard. With mechanical switching, callers dialed the desired number using a dial at the base of their telephone. As each digit in the number was dialed, the dial rotated back to its original position and a click corresponded to the number dialed.<sup>32</sup> With each click an electronic current passed through an electromagnet in the equipment back at the Central Office (telephone company-owned communications center within a telephone exchange), triggering a series of selectors to incrementally connect the call. These phones were called rotary phones and this mechanical switching system remained in place for most phones nationwide through the 1970s, and 40 percent of residential phones were still rotary in 1986 even with the later introduction of touchtone phones.<sup>33</sup>

Electronic switching came into use in the mid-1960s and was the largest single development project ever undertaken by Bell Laboratories.<sup>34</sup> Electronic switching used electronic circuit boards to connect calls rather than mechanical switching and was first tested at an experimental Central Office established by Bell Laboratories in Morris, Illinois. The Morris Central Office served as an archetype for the No. 1 Electronic Switching System installed in Succasunna, New Jersey in 1965 and Central Offices nationwide in the following decades.<sup>35</sup> The new system enabled telephone switching to occur within small fractions of a second and was a pivotal moment in the evolution of telephone switching.

The O'Hare Telephone Building equipment reflects the evolution of telephone technology and includes switching equipment from each phase discussed above. Newspaper articles from the time of the building's opening in October 1961 touted the new O'Hare Telephone Building as having the "latest electronic relays," referencing the mechanical switching equipment that ran dial phones.<sup>36</sup> Mechanical switching was the current technology in 1961; however, as a general practice earlier manual technology was also installed for callers who needed operator assistance. As such, the original switching equipment in the building consisted of both manual and mechanical switching, remnants of which remain in the building today.

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<sup>30</sup> MacNair, "Electronic Switching," 194–95.

<sup>31</sup> Bell Telephone System, *The Telephone in America*, 3.

<sup>32</sup> American Telephone and Telegraph Company, *Things Worth Knowing About the Telephone*, 50–51.

<sup>33</sup> *The Step-by-Step Switch, Part 1* (A Bell System Film, Prepared in Cooperation with The Bell Telephone Company of Pennsylvania and the Southern New England Telephone Company, 1951), <https://www.youtube.com/watch?v=xZePwin92cl>; Bell Telephone System, *The Magic of Communication*, 16–17; Michael Palm, *Technologies of Consumer Labor: A History of Self-Service* (New York: Routledge, 2017), 103.

<sup>34</sup> MacNair, "Electronic Switching," 195–97.

<sup>35</sup> R.W. Ketchledge, "From Morris to Succasunna," *Bell Laboratories Record* 43, no. 6 (June 1965): 204–7.

<sup>36</sup> Edward Schreiber, "O'Hare To Get Improved New Phone System," *Chicago Tribune*, October 5, 1961.



At the time the O'Hare Telephone Building was constructed, electronic switching equipment was being tested but a full transition had not yet been made. The building's construction in 1961 predates the first practical application of electronic switching equipment, which occurred in 1965.<sup>37</sup> Although AT&T often used its local Bell telephone companies to beta test new systems before officially rolling them out companywide, there is no indication O'Hare's communication center was a test location for electronic switching. Electronic switching was installed in the building as it was across the country once this technology was adopted. Much of the mechanical switching equipment was removed with the end of rotary dial phones. As technology advanced, the equipment became smaller and took up less space. As such, the equipment currently housed in the O'Hare Telephone Building, which primarily consists of electronic switching, takes up only a fraction of the space it did back in the 1960s.

### (3) New telephone services in the post-World War II era

A broad trend during the 1950s and 1960s was the introduction of new telephone services for large businesses developed by Bell Laboratories and often implemented and installed at Central Offices. This section discusses these broad trends to understand what new services the O'Hare Telephone Building provided to the airport. New services were continually introduced to address the rapid rise in telephone use and to improve service for AT&T customers. These services included Direct Distance Dialing (DDD), All Number Calling (ANC), Private Branch Exchange (PBX), and Centrex. The Centrex system was implemented at O'Hare and the other new services were generally available to telephone users.

Introduced in the early 1950s, DDD enabled operators to dial long distance calls straight through without the assistance of operators along the route or at the call's destination. By 1953 approximately 40 percent of Bell System long distance calls were handled using DDD.<sup>38</sup> In 1960 Illinois Bell introduced DDD to approximately 67,000 customers in 24 cities and towns, and by the end of that year approximately 567,000 customers could dial direct to any of the 65 million telephones in the United States and Canada.<sup>39</sup> In the early 1960s ANC was introduced and touted as the "numbering system of the future."<sup>40</sup> Previous alpha-numeric numbers were eliminated in favor of a seven-digit phone number with no two-letter prefixes. The new numbering system addressed the need for even more numbers by the 1960s and eliminated mistakes when dialing both letters and numbers.<sup>41</sup>

Bell Systems also offered a new service, PBX, in the postwar era.<sup>42</sup> PBX was a private, on-site telephone system leased to large businesses that enabled more phones than phone lines and connected the business to the public phone network. In contrast to previous systems, each phone within the organization no longer connected directly to the Central Office. Essentially, PBX functioned as a miniature Central Office solely dedicated to the company; an internal switchboard connected calls between internal

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<sup>37</sup> The Morris Central Office served as an archetype for the No. 1 Electronic Switching System installed in Succasunna, New Jersey in 1965. Ketchledge, "From Morris to Succasunna," 204–7.

<sup>38</sup> Bell Telephone System, *The Magic of Communication*, 17–18.

<sup>39</sup> "Illinois Bell Advances for 1960 Outlined," *Decatur Herald*, March 7, 1961; Kenneth P. Todd, Jr., "A Capsule History of the Bell System," *Bell System Memorial*, 2019, [https://beatriceco.com/bti/porticus/bell/capsule\\_bell\\_system.html](https://beatriceco.com/bti/porticus/bell/capsule_bell_system.html).

<sup>40</sup> "All Numerical Phones to Make Debut Soon," *Chicago Tribune*, January 8, 1961, sec. 8.

<sup>41</sup> "All Numerical Phones to Make Debut Soon."

<sup>42</sup> MacNair, "Electronic Switching," 195–97.

users using “extensions” on local phone lines, and a certain number of external phone lines enabled calls outside the PBX system via the Central Office.<sup>43</sup>

Growth during the 1950s began to test the limits of PBX service as businesses became more geographically widespread and more complex in terms of organization. By early 1961 the Bell System was promoting and implementing a new telephone system called Centrex to large business customers in Chicago and across the nation. Centrex was thought of as a “new concept of PBX service.”<sup>44</sup> PBX service was designed for businesses where most communications were internal with only a small proportion of external calls into or out of the system. In contrast to PBX, Centrex could handle an unlimited number of calls through on-site desktop electronic consoles without an on-site switchboard. Centrex also served the communication needs of multiple tenants within a single office building, or large business complexes spread out over a large campus. Centrex reduced the need for operators and required less space on-site than PBX.<sup>45</sup>

With Centrex, each business had its own switchboard located off-site at the Central Office. This switchboard provided callers with access to Direct Inward Dialing (outside callers could bypass switchboard attendants to reach individuals in the organization), Direct Outward Dialing, internal direct calling amongst staff with individual extensions, direct transfer of calls to other staff without switchboard attendant, and individual station billing whereby all long-distance calls were itemized by station number.<sup>46</sup>

To meet the needs of callers using telephones at the airport, Centrex was installed in the new O'Hare Telephone Building, which opened in October 1961.<sup>47</sup> By 1961 the number of Bell System customers with Centrex was rapidly growing, including installation at other airports such as the Los Angeles International Airport (LAX). Several East Coast and European airports had similar internal telephone networks but used an earlier technology.<sup>48</sup>

AT&T primarily marketed Centrex to its customers with more than 200 telephones.<sup>49</sup> Centrex was installed nearly simultaneously around the country as demonstrated in an Autumn 1961 edition of *Bell Telephone Magazine* that explained the new Centrex service to a national readership.<sup>50</sup> The article notes “A small but rapidly growing number of important customers already have this new service. New installations are being

<sup>43</sup> AT&T Bell Laboratories, *Engineering and Operations in the Bell System*, ed. R. F. Rey, Second Edition (Murray Hill, N.J.: AT&T Bell Laboratories, 1983), 54.

<sup>44</sup> Robert F. Landry, “Centrex - A New Concept of PBX Service,” *Bell Telephone Magazine* XL, no. 3 (Autumn 1961): 10.

<sup>45</sup> Landry, “Centrex - A New Concept of PBX Service,” 11.

<sup>46</sup> Landry, “Centrex - A New Concept of PBX Service,” 11; “Tribune's New Phone Number: It's 222-3232,” *Chicago Daily Tribune*, January 27, 1962, sec. 1.

<sup>47</sup> “New Centrex Office for O'Hare Airport Placed in Service,” *Illinois Bell News*, November 1961, 25.

<sup>48</sup> “California State Telephone Central Offices, Area Code 310,” *The Central Office*, 2018, 310, <http://www.thecentraloffice.com/CA/310/CA-310.htm>; Wayne Thomis, “Plan ‘Dial Anywhere’ O'Hare Phone System,” *Chicago Tribune*, March 11, 1960.

<sup>49</sup> Landry, “Centrex - A New Concept of PBX Service,” 11–16.

<sup>50</sup> Landry, “Centrex - A New Concept of PBX Service.”

planned and engineered at an increasing rate.”<sup>51</sup> By July 1962 Centrex was installed for 2,000 phone lines in state government offices in Lansing, Michigan, and the Wisconsin Telephone Company was constructing a building to house a new Centrex system for the University of Wisconsin and state government offices in Madison, Wisconsin.<sup>52</sup> Existing businesses upgraded their systems with Centrex and new facilities installed it because it was the most up-to-date option to serve many callers.

Centrex was also being installed throughout Chicago as reported in a May 1961 *Chicago Tribune* article stating, “Installations of the new service are planned for a number of Chicago businesses in 1961.”<sup>53</sup> In 1961 the University of Illinois, Continental Illinois Bank, R.R. Donnelly and Sons Company, Swift and Company, Sears Roebuck and Company, Union Tank Car Company, Helene Industries, and the Chicago Tribune all installed Centrex.<sup>54</sup>

The Bell System continued to expand during the late 1960s and 1970s as businesses grew throughout Chicago. New office buildings during this period included the 100-story John Hancock Center, First National Bank building, Time-Life building, and the Hartford Life Insurance building, among many others, which required internal telephone systems like Centrex to handle a large number of employees. In the 1980s AT&T's monopoly on telecommunications nationwide was dissolved as a result of an anti-trust case brought against the company. AT&T was subsequently broken up into eight independent firms, including AT&T, NYNEX, Bell Atlantic, BellSouth, Southwestern Bell Corporation, Pacific Telesis, US West, and Ameritech, thus ending the era of the Bell System's dominance of telephone service.<sup>55</sup>

#### (4) Central offices

Around the turn of the twentieth century, AT&T and other smaller telephone companies began constructing free-standing buildings called Central Offices across the country to house equipment and cables for directing and processing telephone calls. The O'Hare Telephone Building functioned as a Central Office dedicated to O'Hare, and this section provides a brief discussion of the history of Central Offices and explains the design of this property type. Central Offices were the nerve center of local telephone networks and connected to every phone within an established telephone exchange. Cities like Chicago with high concentrations of telephones typically had multiple Central Offices. These buildings are also sometimes referred to as dial equipment buildings, switching centers, wire centers, or telephone buildings. In addition to switching equipment, they typically also had offices and workspace for telephone operators, technicians, and other staff.<sup>56</sup>

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<sup>51</sup> Landry, “Centrex - A New Concept of PBX Service,” 16.

<sup>52</sup> “Exciting Changes Due in Telephone Service,” *Lansing State Journal*, February 17, 1963, sec. F; “Building to House Centrex Phone System,” *Wisconsin State Journal*, July 25, 1962, sec. 1.

<sup>53</sup> “Illinois Bell Files Rates on New Service,” *Chicago Daily Tribune*, May 18, 1961.

<sup>54</sup> “It's Called 'Centrex' - Plan Streamlined Phone Service for Businesses,” *Mt. Vernon Register-News*, May 22, 1961.

<sup>55</sup> Len Ackland, “Ring out the Old Bell,” *Chicago Tribune*, January 1, 1984.

<sup>56</sup> “Frequently Asked Questions,” *A Tribute to Direct Distance Dialing, the AT&T Long Lines Microwave Network of California and Telephone Central Offices of the Nation*, 2018, <http://www.thecentraloffice.com/FAQ's/FAQ's.htm>.

From 1900 onward the Bell System was a major telecommunications entity with an ever-expanding national network of state and regional Bell telephone companies.<sup>57</sup> By the mid-twentieth century more than 19,500 Central Offices were operating across the nation and 8,700 of these were operated by Bell System companies.<sup>58</sup> Each Bell subsidiary constructed its own Central Office(s) but AT&T, as the parent company within the Bell System, influenced and provided guidance on the design of these buildings nationwide. Having a building that complemented the surrounding area was important for public perception and community relations. However, these buildings were essentially a concrete or masonry envelope for the important telecommunications equipment inside. Efficient layouts based on optimal functionality tended toward simple rectangular building forms and features, which often stood in contrast to the elaborate forms and architectural ornamentation on nearby residential, commercial, or civic buildings. To fit into their surroundings, early Central Offices typically featured some applied architectural elements of popular styles of the period. For many years Bell System design standards also called for Central Office buildings to have one window per bay for ventilation purposes.<sup>59</sup>

Design philosophies within the Bell System evolved and began to change in the postwar era. AT&T grew to become the largest private builder of telephone buildings in the country during this period. The company constructed an average of more than 1,000 buildings with the Bell System each year, including skyscrapers, Central Offices, and other utilitarian buildings and offices. Between 1955 and 1961 alone the Bell System spent more than \$1 billion on buildings.<sup>60</sup> The company had specific design objectives for buildings across the Bell System intended to promote a positive corporate public image and facilitate efficient operations. Buildings were to reflect design excellence based on site needs, be compatible with their surroundings and a welcome addition to neighborhoods, incorporate economical designs and avoid appearances of luxury or excess, and utilize poured concrete exterior walls and a minimum number of windows to provide maximum protection and continuity of service in the event of natural disaster or attack.<sup>61</sup> Minimal windows were typical in Central Offices. Telephone equipment generated a large amount of heat, so the lack of windows helped maintain a consistent temperature away from sunlight. Climate-controlled interior spaces illuminated with artificial light became the norm for these buildings.<sup>62</sup> AT&T's philosophy on the design and importance of its buildings was expressed in a Spring 1961 edition of *Bell Telephone Magazine*:

This building should have an architectural effect that reflects the progressiveness, alertness, and leadership of the Telephone Company. It should stress the strength needed to provide communications services in war as well as peace, with a continuing indication that the safety of the nation's communications is one of our basic considerations when we plan new facilities.<sup>63</sup>

<sup>57</sup> *A Golden Anniversary, 1878-1928: The Story of Fifty Years of The Bell Telephone in Chicago*, 22.

<sup>58</sup> Bell Telephone System, *The Telephone in America*, 2.

<sup>59</sup> Howard E. Phillips, "Better Buildings Make Better Neighbors," *Bell Telephone Magazine* XL, no. 1 (Spring 1961): 13; Prosser, *Los Angeles Citywide Historic Context Statement: Public and Private Institutional Development / Communications/Telephone History and Development*, 3–9; Bell Telephone System, *The Telephone in America*, 3.

<sup>60</sup> Phillips, "Better Buildings Make Better Neighbors," 12–13.

<sup>61</sup> Phillips, "Better Buildings Make Better Neighbors," 13.

<sup>62</sup> "AT&T Long Lines Building," *NYC Urbanism: Exploring Architecture, Urbanism, History, Planning and Real Estate in New York City*, March 1, 2018, <https://www.nycurbanism.com/brutalnyc/att-long-lines-building>.

<sup>63</sup> Phillips, "Better Buildings Make Better Neighbors," 13.



AT&T retained consulting architects in its New York office to review specific projects undertaken by its subsidiary telephone companies. Subsidiaries typically utilized private architects and engineers to design buildings due to their local expertise and to eliminate the need to employ a large internal staff at AT&T to oversee such activities.<sup>64</sup> As stated in a 1958 *Bell Telephone Magazine*, "The telephone companies generally hired prominent architects in their community, preferably ones in the same city with the building engineer to permit closer coordination."<sup>65</sup> However, AT&T typically utilized its corporate consulting architects to review drawings for local projects early in the process to incorporate needed changes and ensure adherence to its corporate vision.<sup>66</sup>

The interior layout of Central Offices was designed around switching equipment, frames (which served as a distribution point for data transferred between the Central Office's switching equipment and the cables and customer equipment outside the Central Office), cables, and emergency backup equipment. Telephone cables, which were typically carried through underground conduits, entered the building through a cable vault in the basement. From here, cables ran to a mainframe room where thousands of wires extended to terminal blocks on one side of a distributing frame. Additional wires then ran from the opposite side of the distributing frame to the manual, mechanical, or electronic switching equipment. Cross-connections on the distributing frame brought each caller's line to the correct terminal in the switching equipment.<sup>67</sup>

The internal systems of the Central Office are heavily dependent on electricity. An alternating current (AC) charge from the power company enters the Central Office through rectifiers, which convert the power to direct current (DC). The DC power then passes through batteries that are connected to the frames and provide power for a consistent dial tone. Standby generators run by gasoline or diesel were also typically in-place as an emergency backup power source.<sup>68</sup>

In addition to being constructed throughout cities, Central Offices were also constructed at or near airports out of necessity. These Central Offices supported and sometimes were dedicated to airport facilities. LAX had a Central Office by the late 1950s. Other mid-to-late twentieth century examples of Central Offices serving airports were in Greensboro, Miami, Nashville, and several locations in California, including Irvine, Burbank, and Inglewood.<sup>69</sup> The O'Hare Telephone Building was built as a Central Office devoted to telecommunications at the airport.<sup>70</sup> Prior to the construction of the O'Hare Telephone Building, the airport was included within the neighboring Franklin Park Telephone Exchange.<sup>71</sup>

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<sup>64</sup> Phillips, "Better Buildings Make Better Neighbors," 14; Prosser, *Los Angeles Citywide Historic Context Statement: Public and Private Institutional Development/Communications/Telephone History and Development*, 18.

<sup>65</sup> Howard E. Phillips, "What It Means to Be America's #1 Builder," *Bell Telephone Magazine* XXXVII, no. 3 (Autumn 1958): 19.

<sup>66</sup> Phillips, "Better Buildings Make Better Neighbors," 16.

<sup>67</sup> Bell Telephone System, *The Telephone in America*, 7.

<sup>68</sup> Bell Telephone System, *The Telephone in America*, 7.

<sup>69</sup> "California State Telephone Central Offices, Area Code 310," 310.

<sup>70</sup> Research did not indicate the O'Hare Telephone Building served any other subscribers outside the airport. Since O'Hare telephones utilized a four-digit dial plan and residential phones outside O'Hare's system utilized a seven-digit plan, it is highly unlikely the O'Hare Telephone Building ever served subscribers outside the airport property since these two numbering systems would be systematically incompatible.

<sup>71</sup> "New Centrex Office for O'Hare Airport Placed in Service."

### **C. History, design, and construction of the O'Hare Telephone Building and Garage**

The Illinois Bell Telephone Company commissioned the construction of the O'Hare Telephone Building and Garage to support expansion efforts at the airport.<sup>72</sup> The plans for the building and garage were completed by airport designers Naess & Murphy.<sup>73</sup> Although AT&T retained architects to review projects undertaken by subsidiary companies, research was inconclusive as to whether plans for the O'Hare Telephone Building were reviewed by the New York headquarters office. Construction on the new O'Hare Telephone Building began in April 1960 on land leased from the City under a long-term agreement.<sup>74</sup> The O'Hare Telephone Building and the associated Garage were completed between 1960-1961 (see Figure 36 and Figure 37). The Garage is included in the 1960 plans for the O'Hare Telephone Building as an ancillary structure, presumably to house service vehicles.<sup>75</sup>



*Figure 36. Image of the new O'Hare Telephone Building in November 1961 with Garage in background. Photograph credit: HB-24822-A, Chicago History Museum, Hedrich-Blessing Collection, © Chicago Historical Society, published on or before 2016, all rights reserved.*

<sup>72</sup> The 1960 plans for the O'Hare Telephone Building call the building the Illinois Bell Telephone Company Dial Equipment Building.

<sup>73</sup> The plans do not give full names and are noted to be drawn by "D.P.S." and/or W.E.P." Naess & Murphy Architects-Engineers, "Plans for Illinois Bell Telephone Company Dial Equipment Building, Chicago O'Hare International Airport," June 20, 1960, Available in the Chicago Department of Aviation files, Chicago.

<sup>74</sup> Schreiber, "O'Hare To Get Improved New Phone System."

<sup>75</sup> Naess & Murphy Architects-Engineers, "Plans for Illinois Bell Telephone Company Dial Equipment Building, Chicago O'Hare International Airport," A2-3, A15.



*Figure 37. Image of the new O'Hare Telephone Building Garage in 1963. Photograph credit: AT&T Archives and History Center, all rights reserved.*

Construction of the O'Hare Telephone Building coincided with both expansion of the airport and transitions within the telecommunications industry. The airport had hundreds of telephones and needed a system that would be efficient and flexible for its current and expanded size, especially after the planned construction of Terminals 2 and 3, the Rotunda, and the Heating & Refrigeration Plant in the early 1960s. The two-story, \$4 million facility was envisioned as a Central Office for O'Hare with the latest mechanical switching system, emergency power generator, and Centrex to provide the airport with its own telephone network.<sup>76</sup> Illinois Bell installed a Centrex system in the building that provided the airport with its own dedicated dial plan for airport telephones, including airlines and concessionaires.<sup>77</sup> Edwin G. Carr, special contracts manager for Illinois Bell System at the time, described the project in a March 1961 *Chicago Tribune* article, stating that an underground cable network would enable inter-airport calls from any telephone at O'Hare by dialing only four digits rather than seven.<sup>78</sup> The O'Hare Telephone Building also provided a direct line to Chicago proper, eliminating the need for operator assistance on these calls, and saved the public five cents per call.<sup>79</sup>

The dedication ceremony for the O'Hare Telephone Building occurred on October 11, 1961. In attendance were Chicago Mayor Daley; William V. Kahler, President of the Bell Telephone Company; City officials, airlines representatives, and various civic leaders.<sup>80</sup> The plaque in the lobby marking the

<sup>76</sup> Thomis, "Plan 'Dial Anywhere' O'Hare Phone System."

<sup>77</sup> Schreiber, "O'Hare To Get Improved New Phone System"; "New Centrex Office for O'Hare Airport Placed in Service."

<sup>78</sup> Thomis, "Plan 'Dial Anywhere' O'Hare Phone System."

<sup>79</sup> Schreiber, "O'Hare To Get Improved New Phone System."

<sup>80</sup> Schreiber, "O'Hare To Get Improved New Phone System."

building's dedication indicates the building was constructed to serve the special communication needs of O'Hare (see Figure 38).



*Figure 38. Lobby for the O'Hare Telephone Building in November 1961. The dedication plaque, which remains in the building, is visible at left. Photograph credit: HB-24822-E, Chicago History Museum, Hedrich-Blessing Collection, © Chicago Historical Society, published on or before 2016, all rights reserved.*

The form and utilitarian nature of the O'Hare Telephone Building reflects both the function of the building and the unadorned design philosophy that AT&T promoted for Central Office buildings. In form and materials, the O'Hare Telephone Building is like other Central Offices in its rectangular footprint, limited windows for security and climate control, and concrete structural system. The building also has limited ornamentation reflecting economical design and avoiding an appearance of luxury as promoted by AT&T. The interior layout features utilitarian open rooms for equipment. The Garage has a similar form and materials as the telephone building.

#### **D. Naess & Murphy/C.F. Murphy Associates**

The architectural firm of Naess & Murphy, later known as C.F. Murphy Associates, then Murphy/Jahn, and today Jahn, represents one of the largest and most prolific architectural firms in postwar Chicago. The firm represents a "lineage" of Chicago architects, beginning with Daniel Burnham in the nineteenth century, and emerged during a pivotal time in the history of Chicago and its urban development. The works of Naess & Murphy/C.F. Murphy marked a transition in the city from 1930s modern architecture to the International style of the Second Chicago School of Architecture, which was heavily influenced by the work of Mies van der Rohe. Co-founder Charles F. Murphy, Sr. managed the firm and hired multiple architect and designers for various commissions. In the 1950s the firm developed a relationship with Mayor Richard Daley early in his mayoral career and worked on highly visible projects at O'Hare and in



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the downtown Chicago Loop, intended by Daley to promote Chicago as a modern city. This context addresses the background of Charles F. Murphy, his professional relationship with Mayor Daley, and the firm's shift towards the Second Chicago School. A brief summary of the firm following its acquisition by Helmut Jahn in the 1980s is also provided for context of the firm's work at O'Hare.

Charles F. Murphy, Sr. was born in New Jersey in 1890 and moved to Chicago during his childhood. He graduated from the De La Salle Institute, a Catholic technical high school in Chicago, where he was trained as a stenographer. Murphy entered the architectural field in 1911 as secretary for the firm of Daniel Burnham, one of Chicago's leading architects. While working at D.H. Burnham and Company, Murphy became the personal assistant to Ernest Graham, an architect working at the firm. The two maintained a very close working relationship for the next 25 years, with Murphy following Graham to the firm of Graham, Anderson, Probst, and White in 1917.<sup>81</sup> Graham's new firm was one of the most prolific in Chicago, with significant works including the Pittsfield Building (1927), the Straus Building (1923-1924), the Foreman State Bank (1928-1930), and the Field Building (1934). Murphy became a licensed architect while working with Graham, but mostly managed the inner workings of the firm and developed the managerial and administrative skills that he would employ for the remainder of his career.<sup>82</sup>

Ernest Graham passed away in 1936. The day after Graham's death, Murphy was fired from the firm along with two other architects: Sigurd Naess and Alfred Shaw. These three architects soon opened their own firm, Shaw, Naess, and Murphy. Continuing his role as an administrator, Murphy developed the strong corporate organization that would come to define the firm. Sigurd Naess had emigrated to the United States from Norway as a young man in 1902. He became known as a planning expert, and led much of the production work at Shaw, Naess, and Murphy. Alfred Shaw was a designer and painter from Boston who studied at MIT before working in Chicago. Shaw was the first of many designers that Murphy relied on over the years to build the firm's reputation. With the Great Depression followed by World War II, the 1930s and 1940s proved to be a difficult time for most architectural firms, especially one starting out. During this time, Shaw, Naess, and Murphy found work on smaller projects including a remodel of the Museum of Science and Industry in Chicago, designing and installing elevators and escalators in the Marshall Field store, and designing a munitions plant in New Jersey. The firm also gained experience in the aviation field during the war, completing work at Bunker Hill Field (currently Grissom Air Reserve Base) in Indiana and Kindley Air Force Base in Bermuda (now Bermuda International Airport). Due to personal conflicts, among other factors, Alfred Shaw left the firm in 1946 and the firm's name was changed to Naess & Murphy.<sup>83</sup>

<sup>81</sup> Kenan Heise, "Charles F. Murphy, Chicago Architect," *Chicagotribune.Com*, accessed July 22, 2019, <https://www.chicagotribune.com/news/ct-xpm-1985-05-24-8502020167-story.html>; Franz Schulze, *Oral History of Carty Manny* (Chicago, Ill.: Art Institute of Chicago, 1995), 108; Mark J. Bouman and John Zukowsky, Ed., *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: Prestel and The Art Institute of Chicago, 1993), 468.

<sup>82</sup> Ross Miller, "Helmut Jahn and the Line of Succession," in *Chicago Architecture and Design 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: The Art Institute of Chicago and Perstel-Verlog, 1993), 305; Franz Schulze, *Oral History of Carty Manny*, 108; Carol Willis, "Light, Height, and Site: The Skyscraper in Chicago," in *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis*, 1993, 131.

<sup>83</sup> Miller, "Helmut Jahn and the Line of Succession," 305; Franz Schulze, *Oral History of Carty Manny*, 110-11, 152.

The first major project for Naess & Murphy was the Prudential Insurance Building (1952-1955), the first skyscraper built in Chicago since the Field Building in 1934. The 44-story concrete and glass building not only signaled the return of the skyscraper to Chicago, but also signified the arrival of postwar modernism to the urban landscape. Kenan Heise, writing for the *Chicago Tribune* in 1985, argued that the Prudential Building “hinged two eras of Chicago architecture,” and that it “opened the modern, explosive era of Chicago commercial architecture.”<sup>84</sup> Naess & Murphy continued to work on other commercial projects in the 1950s, including the Chicago Sun-Times Building (1957) and the Federal Reserve Addition (1957), which historian Ross Miller has described as “serviceable modernism.” However, the Prudential Building proved to be the firm’s most significant building of the 1950s, not only for its architectural significance, but also because it was at the dedication in 1954 that Murphy met the soon-to-be-mayor Richard J. Daley. The relationship that developed between Murphy and Daley would establish Naess & Murphy as one of the leading architectural firms in Chicago.<sup>85</sup>

After their first meeting, Mayor Daley and Murphy slowly developed a professional relationship that extended through the 1960s. Daley had a vision to rebuild the Chicago Loop as a modern American city, and Murphy’s firm became an integral partner in bringing that vision to reality. Murphy and Daley shared an Irish-Catholic connection, and they had both attended the De La Salle Institute, although Daley graduated from the school decades after Murphy. According to Miller, Daley was impressed with Murphy because he “did not strike Daley as a fancy-pants architect.”<sup>86</sup> Daley soon turned to Murphy to help him prevent a lawsuit from residents along the South Shore attempting to stop the construction of a new water filtration plant. Naess & Murphy worked to make the plant more attractive by designing a civic park as part of the facility and saved the new mayor from the impending lawsuit. Daley then turned to Naess & Murphy to help him with another difficult situation with the city’s new airport at O’Hare Field.<sup>87</sup>

When Daley took office, funding for O’Hare had been a point of contention between the City and the airlines for nearly a decade. However, the new mayor was committed to building a modern airport for Chicago and he soon began direct negotiations with the airlines to reach a mutual agreement in 1956. With funding secured, he commissioned Naess & Murphy to review the plans drafted by Ralph Burke, and construction began in earnest in 1959. Between 1960 and the mid-1970s, the firm was responsible, along with multiple partner firms, for the design and construction of O’Hare buildings including Terminals 2 and 3, the Rotunda, the Heating & Refrigeration Plant, the O’Hare Telephone Building, the City Substation, and the O’Hare Hilton Hotel. The firm was also involved in designing the overall layout of the airport, including the runways, roadways, parking structures, and various other utilitarian buildings and systems.<sup>88</sup> C.F. Murphy Associates was honored in 1963 by the Chicago Association of Consulting Engineers for the

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<sup>84</sup> Heise, “Charles F. Murphy, Chicago Architect.”

<sup>85</sup> Miller, “Helmut Jahn and the Line of Succession,” 303, 305.

<sup>86</sup> Miller, “Helmut Jahn and the Line of Succession,” 303.

<sup>87</sup> Franz Schulze, *Oral History of Carty Manny*, 152.

<sup>88</sup> Carl W. Condit, *Chicago: 1930-70: Building, Planning, and Urban Technology* (Chicago and London: The University of Chicago Press, 1974), 259; Doherty, *The Origin and Development of Chicago-O’Hare International Airport (Dissertation)*, 166, 193, 196; C.F. Murphy Associates, *C.F. Murphy Associates* (Chicago: C.F. Murphy Associates, 1975).

design of the terminal buildings and the Rotunda.<sup>89</sup> An August 1963 issue of *Progressive Architecture* outlined the design of the new O'Hare plan, stating that it “lacks the brilliance and originality of Dulles” but shows strength in details such as “the meticulous care with which the individual buildings were designed; in the expert integration of structural and mechanical services; in the orderly and craftsman-like execution of the interiors, which have visual harmony in spite of the diverse requirements of 13 different airlines; and in the well-designed adjunct service structures, such as the fire station, the heating and refrigeration plant, and the central telephone exchange...”<sup>90</sup>

Sigurd Naess retired in 1959 and Murphy subsequently changed the name of the firm to C.F. Murphy Associates (C.F. Murphy) in 1960. Murphy's son, Charles F. Murphy, Jr., became more involved in the firm. Murphy, Jr. was an admirer of Mies van der Rohe and began hiring designers and architects, many of whom are now associated with the Second Chicago School of Architecture and had either been trained by Mies or were committed to following his design philosophies as embodied in the International style of architecture. The first of these new architects was Stanislaw Gladych, previously employed by Skidmore, Owings, and Merrill, who was hired as the firm's lead designer. Gladych was one of the leading architects at O'Hare for C.F. Murphy along with Carty Manny, Gertrude Kerbis, and John Novack, all of whom were strongly influenced by Mies. Other notable architects employed by C.F. Murphy throughout the 1960s included Otto Stark, Jacques Brownson, and James Ferris. C.F. Murphy's turn toward the International style also fit perfectly into Mayor Daley's vision to modernize Chicago. According to historian Ross Miller, “The radically modern architecture demonstrated that the mayor of Chicago was not simply defending old arrangements, but was doing nothing less than recasting the aging American downtown.”<sup>91</sup> Connecting Chicago to the world with a modern airport facility at O'Hare was an early priority for Daley and his vision to rebuild the city, but it was not the last. In the 1960s, the mayor planned a major redevelopment of the Dearborn Avenue corridor. C.F. Murphy participated in partnerships on three buildings that redefined this corridor of downtown Chicago, including the Richard J. Daley Center (1965), the Chicago Federal Center (1974), and the First National Bank of Chicago (1969). The firm would continue to complete numerous civic commissions for the City of Chicago, employing the Miesian style to recast the city's image in the postwar era.<sup>92</sup> C.F. Murphy did not complete this task alone, however. Throughout the 1960s and 1970s, the majority of the firm's projects were the products of multiple architects and designers collaborating within the firm, as well as partnerships with other reputable firms such as Skidmore, Owings, and Merrill and Mies van der Rohe's private firm.

In 1967 Mayor Daley commissioned C.F. Murphy to design a new exhibition hall at McCormick Place. To assist with the project, the firm hired Eugene Summers, who brought his assistant Helmut Jahn to the firm

<sup>89</sup> City of Chicago, Department of Aviation, *Annual Report 1963*, December 31, 1963, 6, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport, Northwestern University Transportation Library, <https://archive.org/details/annualreport1963chic>.

<sup>90</sup> “Our Two Largest Airports,” *Progressive Architecture* XLIV, no. 8 (August 1963): 103.

<sup>91</sup> Ross Miller, “City Hall and the Architecture of Power,” in *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: Prestel and The Art Institute of Chicago, 1993), 253.

<sup>92</sup> Miller, “Helmut Jahn and the Line of Succession,” 305; Miller, “City Hall and the Architecture of Power,” 249–57; C.F. Murphy Associates, *C.F. Murphy Associates*.

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as well. By 1973 Jahn was promoted to Executive Vice President and Director of Planning and Design within C.F. Murphy and spent the remainder of the decade expanding the firm's stylistic range on multiple projects around the United States, but particularly in Chicago. In 1982 Jahn gained a controlling interest in C.F. Murphy and changed the firm's name to Murphy/Jahn, while significantly reducing the size of the firm. Charles Murphy, Sr. passed away in 1985.<sup>93</sup>

Jahn continued C.F. Murphy's work at O'Hare. In the 1980s, Murphy/Jahn led O'Hare Associates, a joint venture of multiple firms, to complete a new Terminal 1, expand Terminals 2 and 3, and build a new international terminal (Terminal 5), among other airport work.<sup>94</sup> In 2012, Jahn renamed the firm to JAHN.<sup>95</sup> The firm continues to work internationally while maintaining its main office in Chicago.

<sup>93</sup> Heise, "Charles F. Murphy, Chicago Architect."

<sup>94</sup> "Transportation," *JAHN*, accessed August 20, 2019, <https://www.jahn-us.com/transportation>; Jerome R. Butler and Thomas Kapsalis, *O'Hare Development Program* (Prepared by City of Chicago, December 1982), Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/oharedevelopment00chic>, Northwestern University Transportation Library; Gapp, Paul, "O'Hare at the Turning Point: Is Delta's Sparkle the New Direction?," *Chicago Tribune*, August 19, 1984, sec. 13.

<sup>95</sup> Nory Miller, *Helmut Jahn* (New York: Rizzoli, 1986), 7; "Transportation"; Melissa Harris, "Name Change, New Design Leadership at Murphy/Jahn," *Chicago Tribune*, accessed August 20, 2019, <https://www.chicagotribune.com/business/ct-xpm-2012-10-26-chi-name-change-new-design-leadership-at-murphyjahn-20121026-story.html>.



### 3. Recommendation

#### A. Significance

The O'Hare Telephone Building and Garage were evaluated for National Register of Historic Places (National Register) eligibility under *Criteria A, B, C, and D*. Evaluation under each of the National Register Criteria and discussion of period and level of significance and historic integrity is provided below.

##### (1) Criterion A

Under *Criterion A*, "Properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history."

The O'Hare Telephone Building and Garage were completed in 1961 during a period of major airport growth and represent one aspect of the improvement program undertaken at O'Hare during the early 1960s. At this time Terminals 2 and 3, the Rotunda, and support facilities were constructed based on the 1958 airport master plan to address airport expansion, satisfy passenger demand and changes within the aviation industry, and provide new facilities and services for passengers and airport staff.<sup>96</sup> The introduction of jet-engine-powered aircraft to commercial air travel in the late 1950s, which became known as the "jet age," precipitated substantial changes to airport design and operations, pressuring City officials to expand O'Hare to serve this increase in air travel and secure Chicago's standing as a transportation center. Following expansion, O'Hare has served as one of the busiest airports in the United States.<sup>97</sup> Though not outlined in the master plan, the O'Hare Telephone Building and Garage were also constructed to support the airport's expansion. As one of the support facilities, the O'Hare Telephone Building is not a significant example of the 1960s expansion of O'Hare and did not play a significant role in Chicago transportation history during this period. As such, the O'Hare Telephone Building and Garage do not possess significance under *Criterion A* for their association with broad patterns of transportation history at the airport.

The O'Hare Telephone Building was constructed during a period of research and innovation related to electronic switching at Bell Systems Laboratories, but the building does not have a distinctive association with this broad technological development. The 1960 plans for the O'Hare Telephone Building describe it as a "dial equipment building," referring to the long-established mechanical switching equipment that it originally featured.<sup>98</sup> The O'Hare Telephone Building predates the roll-out of electronic switching in New Jersey in 1965 by four years and there is no indication it was designed for electronic switching equipment based on its original interior layout or that it was used as a test location for this technology. Even though

<sup>96</sup> Naess & Murphy, Landrum & Brown, and James P. O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program* (Prepared for the City of Chicago, 1958), 11, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/chicagoohareinte00odon>, Northwestern University Transportation Library.

<sup>97</sup> "Chicago O'Hare International Airport, Crossroads of the World," *Chicago Tribune*, April 7, 1963, sec. 7A: Your Chicago Today.

<sup>98</sup> Naess & Murphy Architects-Engineers, "Plans for Illinois Bell Telephone Company Dial Equipment Building, Chicago O'Hare International Airport."

the O'Hare Telephone Building retains switching equipment from various eras, this is not unusual as it was typical for Central Offices to retain some older equipment as new technologies were installed.

As such, the O'Hare Telephone Building does not possess significance under *Criterion A* for its association with technological development or innovation related to the telecommunications industry, and in particular to electronic switching.

Construction of the O'Hare Telephone Building and Garage also coincided with the introduction of a new service in the early 1960s, called Centrex, that was promoted nationally by AT&T and installed throughout the country. The O'Hare Telephone Building featured the new system and was constructed at the time of the transition toward Centrex. However, this technology was being installed across the country and the incorporation of Centrex at O'Hare simply represents deployment of new technology by AT&T. Its use here is not distinct or unusual from its distribution across Chicago and the nation for many businesses and organizations at the time. Therefore, the O'Hare Telephone Building does not possess significance under *Criterion A* for its association with AT&T's introduction and distribution of new services like Centrex across the nation during the 1960s.

For these reasons, the O'Hare Telephone Building is recommended not eligible for listing in the National Register under *Criterion A: History*.

## **(2) Criterion B**

Under *Criterion B*, "Properties may be eligible for the National Register if they are associated with the lives of persons significant in our past."

The O'Hare Telephone Building and Garage are not associated with any persons of historical significance outside of its architects, engineers, and designers, which are addressed under *Criterion C*. As such, the property is recommended not eligible for listing in the National Register under *Criterion B*.

## **(3) Criterion C**

Under *Criterion C*, "Properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction."

The O'Hare Telephone Building was completed in 1961 as a Central Office for the airport's telephone system. By the 1960s Central Offices were a common telephone property type throughout the nation supporting telephone service. In addition, the O'Hare Telephone Building is not unusual in being located on or adjacent to an airport to provide telephone service to an airport, with other examples built at LAX and other U.S. airports. The O'Hare Telephone Building with its stark concrete and brick exterior with few windows reflects a similar simple form and practical design and layout to house equipment that is found in other Central Office buildings across the country. This also reflects the design and public perception for the Central Offices that was promoted by AT&T. As a result, the O'Hare Telephone Building was a common property type and is one of many postwar examples that had little to no style or architectural

ornamentation. As such, the O'Hare Telephone Building does not possess significance under *Criterion C* as a distinctive type, period, or method of construction.

The O'Hare Telephone Building and Garage were designed by the firm of Naess & Murphy (name changed to C.F. Murphy Associates in 1960), which completed many projects at O'Hare in the 1960s and 1970s. As understood from the firm's history, designs were often a collaborative effort between members of the design team and hired consultants. As such, the O'Hare Telephone Building is not known to be the creative product of any single individual and does not reflect the work of any particular "master" architect, artisan, or craftsperson. Similarly, the design and planning of the O'Hare Telephone Building and Garage do not appropriately reflect the work of Naess & Murphy or C.F. Murphy in any manner that would represent a significant association with the architectural firm.

The O'Hare Telephone Building and Garage both have a simplistic utilitarian design, lack ornamentation, and do not represent a distinctive or fully formed example of any architectural style. The exteriors consist of a concrete and brick masonry and nothing about their design or method of construction is particularly innovative or distinctive. As such, the O'Hare Telephone Building and Garage do not possess significance under *Criterion C* as having high artistic value.

For these reasons, the O'Hare Telephone Building and Garage are recommended not eligible for listing in the National Register under *Criterion C: Architecture*.

#### **(4) Criterion D**

Under *Criterion D*, "Properties may be eligible for the National Register if they have yielded, or may be likely to yield, information important in prehistory or history."

The design, construction, and alterations of the O'Hare Telephone Building and Garage have been well documented, and it is unlikely that the buildings have potential to yield important information that is not otherwise accessible. With thousands of Central Offices or telephone exchange buildings constructed across the nation, the telecommunications equipment inside does not have the potential to provide information that is not already known. As such, the O'Hare Telephone Building and Garage are recommended not eligible for listing in the National Register under *Criterion D*.

### **B. Integrity**

The O'Hare Telephone Building does not possess significance under the National Register Criteria for Evaluation. As such, no integrity analysis was conducted for this building.

### **C. Eligibility**

The O'Hare Telephone Building and Garage do not individually or collectively possess significance under *Criterion A: History*, *Criterion B: Significant Person(s)*, *Criterion C: Architecture*, or *Criterion D: Information Potential* and are recommended as not eligible for listing in the National Register.

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## **G-2.9. Telephone Building Technical Memorandum**



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Great Lakes Region  
Illinois, Indiana, Michigan,  
Minnesota, North Dakota,  
Ohio, South Dakota,  
Wisconsin

Chicago Airports District Office  
2300 East Devon Avenue  
Des Plaines, Illinois 60018

March 20, 2020

Ms. Joy Beasley  
Keeper of the National Register of Historic Places  
National Park Service  
National Register of Historic Places  
1849 C Street, NW (7228)  
Washington, DC 20240

Ms. Beasley:

The Federal Aviation Administration (FAA) is conducting studies in support of Section 106 compliance for a proposed project at O'Hare International Airport (O'Hare). Based on the *Determination of Eligibility (DOE) for the O'Hare Telephone Building and Garage*, the FAA determined the property is not eligible for the National Register of Historic Places. The FAA determination letter and documentation is attached as Appendix A to the *Technical Memorandum, O'Hare Telephone Building and Garage Determination of Eligibility, Additional Historic Context and Response to SHPO Comments*.

After review by the Illinois State Historic Preservation Office (SHPO), the SHPO disagreed with the FAA finding (letter dated December 18, 2019). The FAA reviewed comments received from the SHPO via email on December 30, 2019, and an additional letter on March 16, 2020, and evaluated the new information in considering how to proceed. The SHPO determination letter and comments are attached as Appendix B.

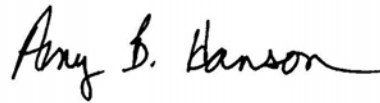
The FAA, with support from its consultant, conducted additional research to investigate points made by SHPO. The FAA also looked for precedent how support and utility buildings, with similarities to the O'Hare Telephone building and Garage, have been evaluated as part of Section 106 compliance conducted for airport projects nationwide in the past 10-15 years. Consideration of the O'Hare Telephone Building and Garage within a potential historic district is addressed in the latter part of the technical memorandum attached.

After considering additional information, the FAA maintains its determination of not eligible for the O'Hare Telephone Building and Garage and is therefore submitting this

package to the Keeper for its formal determination in accordance with 36 CFR § 63.2 - Determination of eligibility process.

If you have any questions, please feel free to call me at (847) 294-7354.

Sincerely,

A handwritten signature in black ink that reads "Amy B. Hanson". The signature is fluid and cursive, with the first name "Amy" being more prominent.

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration

Cc: Aaron Frame, City of Chicago Department of Aviation  
Jamie Rhee, City of Chicago Department of Aviation  
Robert Appleman, Illinois State Historic Preservation Office  
Carol Wallace, Illinois State Historic Preservation Office

**From:** [Hanson, Amy \(FAA\)](#)  
**To:** [joy\\_beasley@nps.gov](mailto:joy_beasley@nps.gov)  
**Cc:** [Aaron Frame](#); [Jamie Rhee](#); [Wallace, Carol](#); [Bartell, Deb \(FAA\)](#); [robert.hoxie@cityofchicago.org](mailto:robert.hoxie@cityofchicago.org); [dwasiuk@hmmh.com](mailto:dwasiuk@hmmh.com); [Kurt M. Hellauer](#); [ORDTAP](#); [Christina Slattery](#); [Amy Squitieri](#); [Colleen Bosold](#); [Brad Rolf](#)  
**Subject:** Request for Formal Determination in accordance with 36 CFR § 63.2 for O'Hare International Airport Telephone Building and Garage  
**Date:** Friday, March 20, 2020 5:24:02 PM  
**Attachments:** [AT&T Buildings Submittal Package to the Keeper Cover Letter 20200320.pdf](#)  
[AT&T Buildings Submittal Package to the Keeper 20200320 final.pdf](#)

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Ms. Beasley,

Please see the attached documentation for your review and determination.

Thank you.

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration  
847-294-7354



## United States Department of the Interior

NATIONAL PARK SERVICE

1849 C Street, NW  
Washington, DC 20240

H32(2280)

May 5, 2020

Ms. Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration  
2300 East Devon Avenue  
Des Plaines, Illinois 60018

Dear Ms. Hanson:

Thank you for your request for a Determination of Eligibility for the O'Hare Telephone Building and Garage, which I received on March 23, 2020.

In a letter dated November 4, 2019, from the Federal Aviation Administration (FAA) to the Illinois State Historic Preservation Office (ILSHPO), the FAA requested ILSHPO concur with the FAA's determination that O'Hare Telephone Building and Garage are not eligible for listing on the National Register of Historic Places (NRHP). In a letter dated December 18, 2019, ILSHPO disagreed with the FAA's determination, and in an email dated December 30, 2019, ILSHPO provided a detailed explanation for its disagreement. In a letter dated March 16, 2020, ILSHPO provided additional explanation for its disagreement.

In your March 20, 2020 letter to me, you have requested a Determination of Eligibility in accordance with 36 CFR § 63.2, et seq. Your request is accompanied by additional support for the FAA's determination which specifically addresses ILSHPO's concerns and presents additional research.

Barbara Wyatt of the NRHP staff reviewed all submitted materials. My determination, based on Ms. Wyatt's review and recommendation is that the O'Hare Telephone Building and Garage are not eligible for the National Register of Historic Places. This letter explains that determination.

### Overview

The O'Hare Telephone Building and Garage were evaluated by the FAA under all four National Register criteria, but only two merited further analysis: Criterion A and Criterion C. Under Criterion A, the FAA evaluated the significance of the telephone building and associated garage in the areas of transportation and telecommunications (DOE, p. 46). (Note that although the latter is not an area of significance specifically identified in Bulletin 16, *How to Complete the National Register Registration Form*, telecommunications may be considered a subcategory under communications). Under Criterion C, the FAA evaluated the architectural significance of the telephone building and garage.



The following comments discuss the evaluation of the telephone building and garage; note, however, that neither party considered the individual eligibility of the garage.

### Criterion A

**Transportation.** There is no disputing that O'Hare was a busy airport in 1961 and an important transportation hub, but the FAA is correct in stating that the telephone building and garage do not possess significance under Criterion A for their association with broad patterns of transportation history at the airport. Although reliable and rapid ground communication supported the airport's transportation function, the telephone building and garage do not represent transportation history.

**Communications.** Both parties agree the telephone building had state-of-the art equipment installed in 1961; however, the initial installation of mechanical switching equipment was eclipsed four years later by the introduction of electronic switching equipment. Regardless of the property's association with the evolving technology, Bulletin 15, *How to Apply the National Register Criteria for Evaluation*, notes that "mere association with historic events or trends is not enough, in and of itself, to qualify under Criterion A. The property's specific association must be considered important as well" (Bulletin 15, p. 12). The information presented by the FAA does not demonstrate association with a specific event marking an important moment in American history, nor a pattern of events that made a significant contribution to local, state, or national development. Significance under Criterion A in the area of communications, therefore, is not evident.

### Criterion C

The aspects of architectural significance under Criterion C that may be applied to the telephone building are "type, period, or method of construction" or "the work of a master" (Bulletin 15, p. 17). The FAA and ILSHPO differ in their approaches to assessing the telephone building's architectural merits, with ILSHPO focusing on Miesian qualities and the FAA, initially, considering it as representing a genre of building design

**Type, Period, or Method of Construction / Miesian Design.** The FAA maintains that the telephone building is representative of a "common telephone property type throughout the nation"; that it is reflective of "a similar simple form and practical design and layout to house equipment that is found in other Central Office buildings across the country"; and that it "also reflects the design and public perception for the Central Offices that was promoted by AT&T" with "little to no style or architectural ornamentation" (DOE, pp. 46-47). The FAA states that between 1957 and 1961, Bell spent more than \$1 billion in the construction of over 6,000 telephone-related buildings across the country" (*Technical Memorandum*, p. 6). The Keeper concludes that available information does not indicate that the O'Hare Telephone Building is eligible under Criterion C as a type, period, or method of construction

By contrast, ILSHPO finds the telephone building to be representative of Miesian design, which is particularly emblematic of Chicago where some of its finest expressions are found. ILSHPO asserts the telephone building's "lack of overt or applied ornament is exactly in line with the Miesian design philosophy that was used in its design" (December 30, 2019, email from Rubano to Hanson, p. 2). ILSHPO considers the telephone building's design to be consistent with the design of other airport buildings designed by Naess and Murphy at O'Hare and that this is an indication that the design is deliberate, not a matter of universal design characteristics of telephone buildings.

ILSHPO presents sufficient description and analysis for the telephone building to be considered Miesian in its appearance, even if it also happens to embody the utilitarian design favored by AT&T for such buildings. The FAA disputes a finding of Miesian design and presents numerous Chicago examples of truly significant Miesian architecture. The Keeper concludes that the telephone building may be Miesian in design, but it is not a significant local example and not eligible for the National Register under Criterion C for this reason.

**Work of Master.** Buildings nominated as the work of a master "express a particular phase in the development of the master's career, an aspect of his or her work, or a particular idea or theme in his or her craft. . . a property is not eligible, however, simply because it was designed by a prominent architect" (Bulletin 15, p. 20). Attribution to prominent local architect Stan Gladych is not definitive, nor is this design's significance as discussed above eligible for association with Gladych or Naess & Murphy. Independently or together, this individual and this firm may be considered master architects and the telephone building may be *attributed* to them, but the telephone building is not significant simply because it was designed by a master architect (or firm). The Keeper does not find the building eligible under Criterion C as the work of a master.

## Conclusion

Based on an analysis of documentation presented by the FAA and ILSHPO, I concur with the FAA's determination that the O'Hare Telephone Building and Garage are not eligible for listing in the National Register of Historic Places.

If you have any questions, please contact Barbara Wyatt at [barbara\\_wyatt@nps.gov](mailto:barbara_wyatt@nps.gov).

Sincerely,

**JOY BEASLEY**

Digitally signed by JOY BEASLEY

Date: 2020.05.05 13:37:34

-04'00'

Joy Beasley  
Acting Associate Director, Cultural Resources,  
Partnerships, and Science  
Keeper of the National Register of Historic Places

Enclosure

cc: Aaron Frame, City of Chicago Department of Aviation  
Jamie Rhee, City of Chicago Department of Aviation  
Carol Wallace, Illinois State Historic Preservation Officer  
Robert Appleman, Illinois Deputy State Historic Preservation Officer



## Technical Memorandum

### O'Hare Telephone Building and Garage Determination of Eligibility Additional Historic Context and Response to SHPO Comments March 20, 2020

#### 1. Introduction

The Federal Aviation Administration (FAA) engaged Mead & Hunt, Inc. (Mead & Hunt) through a third-party contract to conduct the Section 106 of the National Historic Preservation Act of 1966 (Section 106) evaluation, including preparation of a Determination of Eligibility (DOE), for the O'Hare Telephone Building and Garage (Mead & Hunt, November 2019). For a property description, statement of significance, photographs, and a map of the O'Hare Telephone Building and Garage, refer to the DOE, attached as Appendix A. Based on the DOE, the FAA determined the property is not eligible for listing in the National Register of Historic Places (National Register). The Illinois State Historic Preservation Office (SHPO) disagreed with the FAA determination via letter dated December 18, 2019, and provided comments via email on December 30, 2019. The SHPO provided comments as required by Section 106 in a letter dated March 16, 2020, that addressed Historic Relevance (*Criterion A*) and Architectural Relevance (*Criterion C*). The DOE and SHPO comments are provided as part of this packet of materials submitted by the FAA to the Keeper of the National Register (see Appendix B).

The FAA requested that Mead & Hunt conduct additional research to investigate points made by the SHPO with specific attention to how support and utility buildings, with similarities to the subject building, were evaluated as part of Section 106 compliance conducted for airport projects nationwide during the past 10-15 years.

This memorandum presents the results of the additional research referred to above and specifically addresses comments provided by SHPO. Each point made by SHPO is introduced and then addressed in the following order:

- SHPO Comment – summarizes a specific point raised in the SHPO email of December 30, 2019, and letter of March 16, 2020.
- Supporting information from DOE – cites or briefly restates original finding related to the SHPO comment.
- Response – presents additional research, provides citations to support such research, where appropriate, and reiterates related evidence as presented in the DOE that directly relates to the SHPO comment.

Response to a request for consideration of the O'Hare Telephone Building and Garage within a potential historic district is addressed in the latter part of this document (see page 27).

This research and evidence are provided in support of the FAA's determination that the O'Hare Telephone Building and Garage is not eligible for listing in the National Register. The finding of not eligible is based on the following:

- The O'Hare Telephone Building served as a central office to connect voice calls within, to, and from the airport. This telecommunications function of the O'Hare Telephone Building was not critical to the airport's primary function of enabling air travel. The building did not in and of itself play an important role in airport communications. Many support buildings contributed to this function at the airport.
- The O'Hare Telephone Building included modern technology, but it was not state of the art since the same type of technology was being installed in other buildings that were constructed earlier or at the same time.
- Although the building exhibits Miesian style elements, it does not display sufficient distinctive characteristics to be an important example of Miesian architecture in Chicago or its environs.
- The O'Hare Telephone Building is not an important example of a "work of master" for its association with Naess & Murphy/C.F. Murphy and firm architect Stanislaw (Stan) Gladych. In fact, several other works in Chicago better embody the distinctive identity associated with the firm's architectural legacy.
- As an example of an architect-designed Central Office property type, the O'Hare Telephone Building exhibits the design guidelines established by Bell Telephone for Central Offices, but it is not distinct from the thousands of other similar properties commissioned by the Bell Telephone Company and its regional subsidiaries during the same period.

## **2. Response to SHPO Comments**

### **SHPO Comment #1 – Significant role in transportation history of the city of Chicago**

In its March 16, 2020, letter SHPO identified the O'Hare Telephone Building "as an example of the expansion of O'Hare, it plays a significant role in the transportation history of the City of Chicago."

**DOE Information (page 45):**

The O'Hare Telephone Building and Garage were completed in 1961 during a period of major airport growth and represent one aspect of the improvement program undertaken at O'Hare during the early 1960s. At this time Terminals 2 and 3, the Rotunda, and support facilities were constructed based on the 1958 airport master plan to address airport expansion, satisfy passenger demand and changes within the aviation industry, and provide new facilities and services for passengers and airport staff. The introduction of jet-engine-powered aircraft to commercial air travel in the late 1950s, which became known as the "jet age," precipitated substantial changes to airport design and operations, pressuring City officials to expand O'Hare to serve this increase in air travel and secure Chicago's standing as a transportation center. Following expansion, O'Hare has served as one of the busiest airports in the United States. Though not outlined in the master plan, the O'Hare Telephone Building and Garage were also constructed to support the airport's expansion. As one of the support facilities, the O'Hare Telephone Building is not a significant example of the 1960s expansion of O'Hare and did not play a significant role in Chicago transportation history during this period. As such, the O'Hare Telephone Building and Garage do not possess significance under Criterion A for their association with broad patterns of transportation history at the airport.

**Response: The FAA disagrees that the O'Hare Telephone Building is individually eligible as an example of the expansion of O'Hare.**

The O'Hare Telephone Building on its own did not play a significant role in the transportation history of the city of Chicago (see Historic District discussion on page 27).

**SHPO Comment #2 – Role in airport communications.**

SHPO commented in its December 30, 2019, email and March 16, 2020, letter that the O'Hare Telephone Building was the "nerve center for airport communications" and that "as the sole and dedicated communications center for the airport, it played a critical role in O'Hare's very function."

**DOE Information (page 35):**

The O'Hare Telephone Building functioned as a Central Office dedicated to O'Hare.

The role of the O'Hare Telephone Building as a critical part of O'Hare's communication infrastructure was not fully evaluated in the DOE. Additional research was conducted to address this point.

**Response: The role of the O'Hare Telephone Building was not critical to the airport's primary function of enabling air travel. Its telecommunications function was secondary.**

Airport communications directed through the telephone building were in support of the air travel, which is the airport's primary function. Airport communications at O'Hare were facilitated by three active air traffic control towers, the Chicago Department of Aviation (CDA) Control Tower (a former FAA tower now used by the CDA for monitoring the airfield), three ramp towers, telecommunication systems internal to the four terminal buildings, and the O'Hare Telephone Building. As such, it was part of a larger communications infrastructure built to serve the airport.

Every airport has an interconnected set of utilities and support facilities that contribute to its overall function. All support functions at O'Hare are currently and were historically organized and directed around



air travel. In addition to the telephone building, the support facilities built during the expansion of O'Hare during the 1960s and early 1970s included the Heating & Refrigeration Plant, fire stations, rental car facilities, and parking garage. Each support building was needed for the airport to function. Telecommunications was just one of the many required support utilities needed for a functioning airport.

The telecommunication needs of the airport prior to 1961 were provided by the Franklin Park Telephone Exchange (located off airport property), which served as the telecommunications center for the airport. As noted in the DOE, the O'Hare Telephone Building built in 1961 was not the first telecommunications building to serve O'Hare. The O'Hare Telephone Building served as a central office to connect voice calls within, to, and from the airport.<sup>1</sup> This was not a new service but rather facilitated continuation of the existing airport telephone service. The 1961 building represents an update to telecommunication at the airport to continue a necessary service.

The FAA disagrees with the characterization of the telecommunications building as the "nerve center for airport communication," as well as with the view that this building plays "a critical role in O'Hare's very function."

### **SHPO Comment #3 – State of the art technology.**

SHPO commented in its December 30, 2019, email and March 16, 2020, letter that the "technology was state of the art for 1961" and that the per-square foot cost is "a good indicator of the level of attention and technology this center was given."

### **DOE Information (page 46):**

Construction of the O'Hare Telephone Building and Garage also coincided with the introduction of a new service in the early 1960s, called Centrex, that was promoted nationally by AT&T and installed throughout the country. The O'Hare Telephone Building featured the new system and was constructed at the time of the transition toward Centrex. However, this technology was being installed across the country and the incorporation of Centrex at O'Hare simply represents deployment of new technology by AT&T. Its use here is not distinct or unusual from its distribution across Chicago and the nation for many businesses and organizations at the time. Therefore, the O'Hare Telephone Building does not possess significance under *Criterion A* for its association with AT&T's introduction and distribution of new services like Centrex across the nation during the 1960s.

### **Response – The technology included in the building is not state of the art.**

The telecommunications technology employed at O'Hare, as contained within the 1961 telephone building, was evaluated within a broad context of other airports and private or governmental campuses and complexes that also used the Centrex system to consider if and how the technology is "state of the art." Illinois Bell Telephone Company (Illinois Bell), a Bell System company, constructed the O'Hare building. Bell and its associated companies were continuously innovating and upgrading service options for its customers. By 1958 Bell Telephone introduced a new system known as Centrex to update and

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<sup>1</sup> Memo to Amy Hanson, Federal Aviation Administration, from Joe McHugh, Chicago Department of Aviation, February 19, 2020.

replace older systems. Centrex could handle an unlimited number of calls through an on-site desktop electronic console without an on-site switchboard, in contrast to previous systems that required more space and operators. Centrex could serve multiple tenants within a single building or large complex.<sup>2</sup>

Centrex was introduced at O'Hare in 1961 in the construction of the new telephone building. At the time, the technology that enabled Centrex had been in place for three years. The first documented installation of the new Centrex system was in 1958 at the U.S. Air Force Academy in Colorado Springs, Colorado, by Mountain States Telephone, a Bell System company. The first private installation was in January 1959 at the Dow Chemical Company in Midland, Michigan, by Michigan Bell, a Bell System company.<sup>3</sup> Centrex was adopted across the country at a rapid pace, with state government buildings in Indianapolis and Los Angeles initiating the service in 1960, and with the planned installation in downtown Montreal, Quebec, Canada, that same year.<sup>4</sup> Centrex was also installed at Michigan State University by September 1960; at this time the new system was referred to in *The State Journal* as "the most modern telephone service on any campus in the world."<sup>5</sup> At the same time, it is assumed the City of Philadelphia had installed the system as the *Philadelphia Inquirer* noted that Bell was sending instructors to train on Centrex at City Hall and other departments and other facilities including at the International Airport.<sup>67</sup> In a March 1961 Centrex service status report, the system was reported as "now being installed at the Idlewild [now JFK], O'Hare and Los Angeles airports."<sup>8</sup> By the early 1960s Centrex continued to be used across the country, including at the Pentagon, several naval installations, and private entities and large-scale campuses.<sup>9</sup>

As the Centrex system was being installed across the country, Chicago was no exception. A May 1961 *Chicago Tribune* article stated: "Illinois Bell Telephone Company yesterday filed tariffs with the Illinois Commerce Commission on a new streamlined telephone service called 'Centrex,' which has been developed to fit the needs of large business customers. Installation of the new service is planned for a number of Chicago businesses in 1961."<sup>10</sup> Upon the system's launch at O'Hare in 1961, the airport was the sixth such instance of Centrex in the state of Illinois, preceded by implementation at the American Oil Company (June 19, 1961); Peoples Gas Light & Coke Co. (June 19, 1961); R.R. Donnelley (July 1,

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<sup>2</sup> Robert F. Landry, "Centrex - A New Concept of PBX Service," *Bell Telephone Magazine* XL, no. 3 (Autumn 1961): 11.

<sup>3</sup> George Sprio, "Centrex Service with No. 5 Crossbar," *Bell Laboratories Record*, October 1962, 329.

<sup>4</sup> "Bell Plan Speeds Business Phoning," *The Financial Post*, November 12, 1960, 3; R. F. Landry, "Centrex Service - Status Report" (American Telephone and Telegraph Company, March 28, 1961), AT&T Archives and History Center.

<sup>5</sup> "State Will Install Direct-Dial System," *The State Journal*, October 23, 1961; "Discusses Growth of Telephone: Emerson Ohl Is Guest Speaker at Meeting of the Zonta Club," *The State Journal*, September 21, 1961.

<sup>6</sup> "Discusses Growth of Telephone: Emerson Ohl Is Guest Speaker at Meeting of the Zonta Club."

<sup>7</sup> C. Allen Keith, "Dateline...Delaware Valley, U.S.A.," *The Philadelphia Inquirer*, September 18, 1961, 29.

<sup>8</sup> Landry, "Centrex Service - Status Report."

<sup>9</sup> "O'Hare Airport Gets New Phone Building," *Arlington Heights Herald*, October 19, 1961; Keith, "Dateline...Delaware Valley, U.S.A."; "New Telephone System Taking Over at MCAS," *Yuma Daily Sun*, June 12, 1964.

<sup>10</sup> "Illinois Bell Files Rates on New Service," *Chicago Daily Tribune*, May 18, 1961.

1961); Swift & Co. (August 5, 1961); and Sears Roebuck & Co. (September 5, 1961).<sup>11</sup> Other Centrex systems installed in Chicago that same year included the University of Illinois, Continental Illinois Bank, Union Tank Car Company, Helene Industries, and the Chicago Tribune.<sup>12</sup>

As demonstrated in the installations that preceded it, the O'Hare building was neither unique nor the first in the installation of Centrex technology. While it was described in more than one source as the "most modern" telephone communications system, Centrex was also described at earlier installations in the same manner. Its use at O'Hare does not represent a distinctive innovation in telecommunications since the deployment of the Centrex technology was part of a sweeping nationwide trend that began in 1958 and encompassed a wide range of businesses, quickly becoming the norm.

Between 1957 and 1961 Bell spent more than \$1 billion in the construction of over 6,000 telephone-related buildings across the country.<sup>13</sup> In the Chicago area Illinois Bell was constructing a number of new facilities in the late 1950s and early 1960s, including the Lawndale Central Office in Chicago, a three-story dial telephone exchange building completed in 1960 at a cost of \$5 million, on-par with Illinois Bell's approximate \$4 million cost of the O'Hare Telephone Building.<sup>14</sup> Thus, the building's cost does not represent an exceptional investment in technology.

#### **SHPO Comment #4: Exemplifies Miesian architecture.**

SHPO commented in the December 30, 2019, email that the DOE on "Page 40 states, 'The building also has limited ornamentation reflecting economical design and avoiding an appearance of luxury as promoted by AT&T.' The building's lack of overt or applied ornament is exactly in line with the Miesian design philosophy that was used in its design. The exposed concrete structural frame, solid brick infill partitions, modular plan and severe exterior appearance are all characteristics of Miesian architecture. The small lobby and main office are appointed with a well-detailed storefront system and full-height glazed partitions, polished terrazzo floor, glazed terra-cotta walls and an ornamental dedicatory plaque. There are no interior public spaces because of the utilitarian nature of the interior functions. But from the exterior and lobby, it is exactly consistent with the overall Miesian design that Naess and Murphy used in the rest of the airport. Secondly, the avoidance of an appearance of luxury was only one of Bell's directives."

"Page 46 states that central telephone offices were a common property type. While this is true, this building is not a common iteration for a central telephone office. No other, or very few other, central

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<sup>11</sup> Illinois Bell Telephone Company, "Illinois Bell Telephone Company Marketing Department - Chicago Area Monthly Report - Centrex Type 1 Section I - Completed Installations," January 1, 1966, AT&T Archives and History Center.

<sup>12</sup> "It's Called 'Centrex' - Plan Streamlined Phone Service for Businesses," *Mt. Vernon Register-News*, May 22, 1961.

<sup>13</sup> Howard E. Phillips, "Better Buildings Make Better Neighbors," *Bell Telephone Magazine* XL, no. 1 (Spring 1961): 12.

<sup>14</sup> Wayne Thomis, "Plan 'Dial Anywhere' O'Hare Phone System," *Chicago Tribune*, March 11, 1960; "Break Ground for Phone Co. Dial Building," *Chicago Daily Tribune*, March 26, 1959, sec. 3.

offices at the time looked like this building. Its lack of ornament is characteristic of its Miesian design.”

SHPO added in its March 16, 2020, letter that “the appearance of efficiency and avoidance of applied ornament fit the directive of this type of architecture” and that the “building is an excellent example of Modernist architecture, as influenced by Ludwig Mies van der Rohe.”

**DOE Information (page 47):**

The O'Hare Telephone Building and Garage both have a simplistic utilitarian design, lack ornamentation, and do not represent a distinctive or fully formed example of any architectural style. The exteriors consist of a concrete and brick masonry and nothing about their design or method of construction is particularly innovative or distinctive. As such, the O'Hare Telephone Building and Garage do not possess significance under *Criterion C* as having high artistic value.

**Response: The building is not an important example of Miesian architecture.**

Ludwig Mies van der Rohe (commonly referred to as Mies) is best known for promoting a particularly streamlined version of Modern architecture that came to define the American city in the years after World War II. As the head of the architecture department at the Illinois Institute of Technology (IIT), he trained a generation of architects to follow his philosophy of architecture based on reducing buildings to their most essential elements. Mies developed much of his philosophy as a young architect in Germany, where he became associated with the International style. The architects of the International style believed modern society had become “impersonal and collective” and that new architecture should reflect that view. Mies embraced the impersonal nature of modern technology and dedicated himself to the perfection of artistry through the use of modern materials and methods.<sup>15</sup> Rejecting all sense of subjectivity, he aspired to objectivity in architecture by reducing buildings to their most basic elements. This stylistic reductionism with its focus on the creation of space, both exterior and interior and defined yet open and connected spaces, was also achieved through the precise expression of modern materials. Miesian architectural principles were well summarized by architect Werner Blaser, who wrote: “Space is primary and the position of the walls is determined by it. Interior and exterior form a whole. In this spatial freedom the static principle of slab, beam and column, i.e. of load and support, can be expressed. As the logical sequel to these lucid requirements we have the articulation of proportions in surface and space.”<sup>16</sup>

Mies brought this philosophy to the United States in 1938, when he accepted an invitation to develop a new curriculum for the architecture department at the Armour Institute in 1938, which became IIT in 1940. Under Mies, the architecture department of IIT grew from a relatively unknown technical school to one of the most influential architecture programs in the country.”<sup>17</sup> The Armour Institute was founded in 1890, during the rise of the First Chicago School of Architecture. The architects of the First Chicago School, such as Louis Sullivan, Daniel Burnham, and John Wellborn Root, among others, developed a new

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<sup>15</sup> Richard Pommer, “Mies van Der Rohe and the Political Ideology of the Modern Movement in Architecture,” in *Mies van Der Rohe: Critical Essays* (Cambridge, Mass.: MIT Press, 1989), 133.

<sup>16</sup> Werner Blaser, *Mies van Der Rohe: Continuing the Chicago School of Architecture*, Second edition (Basel, Boston, Stuttgart: Birkhauser Verlag, 1981), 7.

<sup>17</sup> Blaser, *Mies van Der Rohe: Continuing the Chicago School of Architecture*, 30.

system of architecture that “emphasized structure and function over ornamentation.”<sup>18</sup> Mies advanced Sullivan’s famous slogan “form follows function” toward the design of a form so basic that it could suit any function. The architects, trained under and influenced by Mies’s curriculum, became known as the Second Chicago School of Architecture, in part because they extended the ideals of those earlier architects to new levels of austerity and functionality.

The primary features of the Miesian style include rectilinear forms, a lack of ornamentation beyond accentuating the building materials, use of modern materials such as glass and steel, and open internal and external spaces framed by the building—all to emphasize form and function.

As described in the *National Register Bulletin: How to Apply the National Register Criterion*, for a property to be eligible under Criterion C for “distinctive characteristics,” it “must clearly contain enough of those characteristics to be considered a true representative of a particular type, period, or method of construction.”<sup>19</sup> The O’Hare Telephone Building exhibits some characteristics of Miesian design, including rectilinear form, lack of ornamentation, and accentuation and efficiency of its building materials, but does not strongly emphasize function and form or display enough features of the style to be considered an important example of Miesian architecture. Although SHPO notes that the O’Hare Telephone Building’s “appearance of efficiency and avoidance of applied ornament fit the directive of this type of architecture,” the building does not embody the design philosophy of Miesian architecture to the extent of other, more significant examples by Naess & Murphy/C.F. Murphy and by other contemporaries of Mies built in Chicago in the post-World War II (postwar) period. In particular, the O’Hare Telephone Building does not display the characteristic open internal or external spaces, curtain walls, or applied I-beam mullions.

A vast body of architectural work constructed in and around Chicago from the 1940s to the 1970s can be generally categorized as Miesian. The architectural works by Mies himself and numerous other buildings better represent the style locally. Important examples of Miesian architecture in Chicago that were not designed by Mies are recognized to be:

- Lakeside Center at McCormick Place (see Figure 1 and Figure 2), 1971, designed by C.F. Murphy and Associates. Featured in the AIA Guide to Chicago.<sup>20</sup> AIA Honor Award recipient, 1972.<sup>21</sup>

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<sup>18</sup> “Mies: The Man, The Legacy,” *Mies Van Der Rohe Society*, accessed August 16, 2019, <http://miessociety.org/mies/>.

<sup>19</sup> National Park Service, *How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: Department of the Interior, 1997), 18.

<sup>20</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago* (Chicago: University of Illinois Press, 2015), 108.

<sup>21</sup> Jane Holtz Kay, “Professional Honors For 9,” *The Boston Globe*, May 21, 1972, sec. B.



- Continental Insurance Building (see Figure 3), 1962, designed by C.F. Murphy and Associates. Featured in the AIA Guide to Chicago.<sup>22</sup> AIA Honor Award recipient, 1964.<sup>23</sup> Designated a Chicago Landmark in 2011 as part of Continental Center.<sup>24</sup>
- Chicago Civic Center (now the Richard J. Daley Center; see Figure 4), 1965, designed by C.F. Murphy and Associates, Skidmore, Owings & Merrill and Loeb, Schlossman & Bennett. Featured in the AIA Guide to Chicago.<sup>25</sup> Recipient of the AIA Honor Award, 1968.<sup>26</sup>
- Lake Point Tower (see Figure 5), 1968, designed by Schipporeit and Heinrich. Featured in the AIA Guide to Chicago.<sup>27</sup>
- John Hancock Center (now 875 North Michigan Avenue; see Figure 6), 1969, designed by Skidmore, Owings, & Merrill. Featured in the AIA Guide to Chicago.<sup>28</sup>

Other buildings at O'Hare serve as more distinguished examples of Miesian architecture, including the following works:

- Terminal 2 (see Figure 7), 1962, designed by Naess & Murphy. Featured in the AIA Guide to Chicago.<sup>29</sup>
- Terminal 3, 1962, designed by Naess & Murphy. Featured in the AIA Guide to Chicago.<sup>30</sup>
- Heating & Refrigeration Plant (see Figure 8), 1961, designed by Naess & Murphy. Featured in the AIA Guide to Chicago.<sup>31</sup>
- O'Hare International Tower Hotel (now the O'Hare Hilton Hotel; see Figure 9), 1973, designed by C.F. Murphy Associates. Featured in the AIA Guide to Chicago.<sup>32</sup>

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<sup>22</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago*, 50.

<sup>23</sup> City of Chicago, "Landmark Designation Report Continental Center 55 E. Jackson Blvd.," July 2011, 12.

<sup>24</sup> City of Chicago, "Landmark Designation Report Continental Center 55 E. Jackson Blvd."

<sup>25</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago*, 71.

<sup>26</sup> City of Chicago Department of Planning and Development, "Preliminary Summary of Information: Daley Center" (City of Chicago Department of Planning and Development, June 2001), 11.

<sup>27</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago*, 147.

<sup>28</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago*, 139.

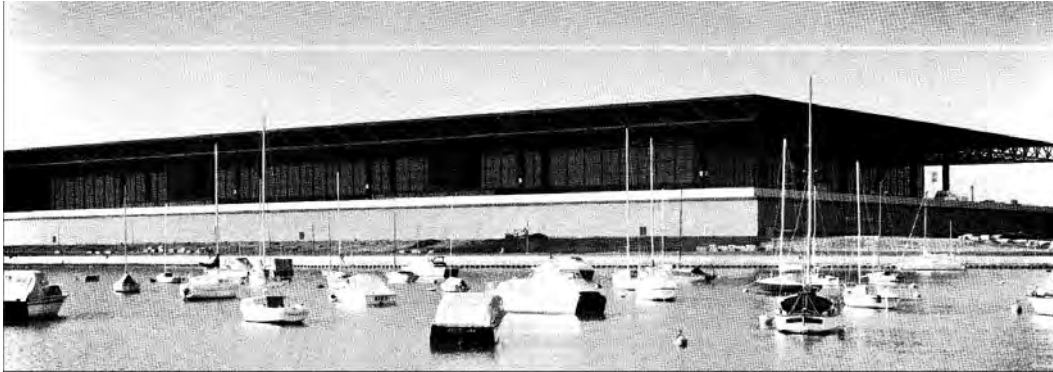
<sup>29</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago*, 287.

<sup>30</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago*, 287.

<sup>31</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago*, 288.

<sup>32</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago*, 288. Terminal 2, Terminal 3, and the Heating & Refrigeration Plant were determined not eligible due to a lack of integrity, while the O'Hare International Tower Hotel was not evaluated for eligibility.

At the time of construction, these original designs were evocative of Miesian architecture, especially in the form of curtain walls of windows and extruded I-beam mullions applied to the exterior. The AIA Guide to Chicago describes the Heating & Refrigeration Plant as “O’Hare’s finest Miesian building” and “Chicago Modern at its best.”<sup>33</sup> These significant influences of Miesian architecture are not present in the O’Hare Telephone Building.



*Figure 1. Lakeside Center at McCormick Place shortly after construction in 1971, designed by C.F. Murphy and Associates.<sup>34</sup>*



*Figure 2. Lakeside Center at McCormick Place, designed by C.F. Murphy and Associates.<sup>35</sup>*

<sup>33</sup> American Institute of Architects, Chicago, *AIA Guide to Chicago*, 288.

<sup>34</sup> “Graceful Solution to Controversy,” *Architectural Forum* 135, no. 4 (November 1971): 37.

<sup>35</sup> Antonio Vernon, *McCormick Place*, Photograph, January 10, 2007, [https://commons.wikimedia.org/wiki/File:20070110\\_McCormick\\_Place\\_\(2\).JPG](https://commons.wikimedia.org/wiki/File:20070110_McCormick_Place_(2).JPG).



*Figure 3. Continental Insurance Building, designed by C.F. Murphy and Associates.<sup>36</sup>*



*Figure 4. Chicago Civic Center (now Richard J. Daley Center) designed by C.F. Murphy and Associates, Skidmore, Owings & Merrill and Loeb, Schlossman & Bennett.<sup>37</sup>*

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<sup>36</sup> City of Chicago, "Landmark Designation Report Continental Center 55 E. Jackson Blvd."

<sup>37</sup> Potro, *Richard J. Daley Center*, Chicago, Chicago, April 4, 2015, Photograph, April 4, 2015



*Figure 5. Lake Point Tower, designed by Schipporeit and Heinrich.<sup>38</sup>*



*Figure 6. John Hancock Center, designed by Skidmore, Owings, & Merrill.<sup>39</sup>*

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<sup>38</sup> Daniel Schwen, *Lake Point Tower*, Photograph, August 17, 2008, [https://commons.wikimedia.org/wiki/File:Lake\\_Point\\_Tower.jpg](https://commons.wikimedia.org/wiki/File:Lake_Point_Tower.jpg).

<sup>39</sup> E. Kvelland, *John Hancock Center*, Photograph, April 22, 2006, [https://commons.wikimedia.org/wiki/File:Chicago\\_6.JPG](https://commons.wikimedia.org/wiki/File:Chicago_6.JPG).





*Figure 7. 1962 photograph of Terminal 2 at O'Hare at night.<sup>40</sup>*



*Figure 8. The H&R Building west facade shortly after completion. Photograph credit: HB-25500-W, Chicago History Museum, Hedrich-Blessing, Collection, ©2019 Chicago Historical Society, all rights reserved.*

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<sup>40</sup> Kori Rumore, "From Farmland to 'Global Terminal': A Visual History of O'Hare International Airport," *Chicago Tribune*, March 27, 2019, <https://www.chicagotribune.com/news/ct-ohare-international-airport-development-history-timeline-htmlstory.html>.





*Figure 9. O'Hare International Tower Hotel (now Hilton Hotel), as altered with addition of central roof parapet. Mead & Hunt, Inc. photograph (2019).*

**SHPO Comment #5: Significant representation of the work of Naess & Murphy and work of Stan Gladych.**

SHPO makes two points regarding the O'Hare Telephone Building representing the work of Naess & Murphy. First, SHPO commented in its December 30, 2019, email that the DOE on "Page 45 says the building was not outlined in the master plan. But a 3/11/60 Tribune article states 'The site was chosen with the approval and consultation of Naess and Murphy, the architectural and general contract managing firm for the City in the major O'Hare development program.'"

Second, SHPO commented in its December 30, 2019, email that the DOE on "Page 47 states that the building does not 'appropriately reflect the work of Naess and Murphy in any manner that would represent a significant association with the architectural firm.' This is not correct. This building precisely fits into the Miesian aesthetic that the firm embraced since its first Miesian commission, the Jardine Water Filtration Plant, whose design the firm started on in 1953. C.F. Murphy partner Carter Manny, in his oral history at the Art Institute of Chicago, said that Stan Gladych brought Miesian design to the firm. Gladych designed Jardine, and we know he worked on O'Hare. The firm was fully steeped in Miesian design and the design espoused by the Illinois Institute of Technology by the time it was designing O'Hare and this building. Miesian influences continued at C.F. Murphy long after O'Hare was completed. The firm employed the same Miesian design philosophy for its 1970 AT&T switching station on Dorchester in Chicago."

SHPO added in its March 16, 2020, letter that the O'Hare Telephone Building was "designed by Stan Gladych of the prominent architectural firm C.F. Murphy and Associates."

**DOE Information (page 47):**

The O'Hare Telephone Building and Garage were designed by the firm of Naess & Murphy (name changed to C.F. Murphy Associates in 1960), which completed many projects at O'Hare in the 1960s and 1970s. As understood from the firm's history, designs were often a collaborative effort between members of the design team and hired consultants. As such, the O'Hare Telephone Building is not known to be the creative product of any single individual and does not reflect the work of any particular "master" architect, artisan, or craftsman. Similarly, the design and planning of the O'Hare Telephone Building and Garage do not appropriately reflect the work of Naess & Murphy or C.F. Murphy in any manner that would represent a significant association with the architectural firm.

**Response to the first SHPO point: The O'Hare Telephone Building was not part of O'Hare's 1958 master plan, but the location was later approved by Naess & Murphy in their role providing oversight of O'Hare's development.**

In 1955 Chicago Mayor Richard Daley commissioned the architectural firm Naess & Murphy to review the original O'Hare expansion plan and build upon it with modifications to accommodate the new larger jet engine aircraft, as well as improve automobile access to the terminals. The first phase of airport construction was presented in the 1958 master plan document titled *The First Stage Development Program* prepared for the City by Naess & Murphy in partnership with the airport consulting firm of Landrum & Brown.<sup>41</sup> The plan outlined proposed locations and preliminary design specifications for new primary buildings including terminals and a restaurant, as well as locations and design details for secondary buildings such as the Heating & Refrigeration Plant, fire station, cargo area, and hangar area. In addition, the proposed future location was identified for non-municipal bond buildings (assumed to be privately funded) such as the post office site, motel site, automobile service center, and flight kitchen.<sup>42</sup>

The O'Hare Telephone Building was not included in the 1958 master plan, but the location was later approved by Naess & Murphy in their role providing oversight of O'Hare's development.<sup>43</sup> A birds-eye view sketch of the planned service area of the airport depicts the planned Heating & Refrigeration Plant among other secondary service buildings but does not include the telephone building later constructed in the vicinity (see Figure 10).<sup>44</sup> The omission of the O'Hare Telephone Building in the 1958 master plan indicates it was not originally conceived as part of the expansion of the airport. A review of City documents including annual reports, master plan reports and analyses, and various other documents referencing the expansion of O'Hare do not mention the O'Hare Telephone Building until the 1960 publication of the CDA's *Annual Report* and the 1960 publication of the *Master Plan Report*, both published months after construction began on the building. In these documents, the O'Hare Telephone

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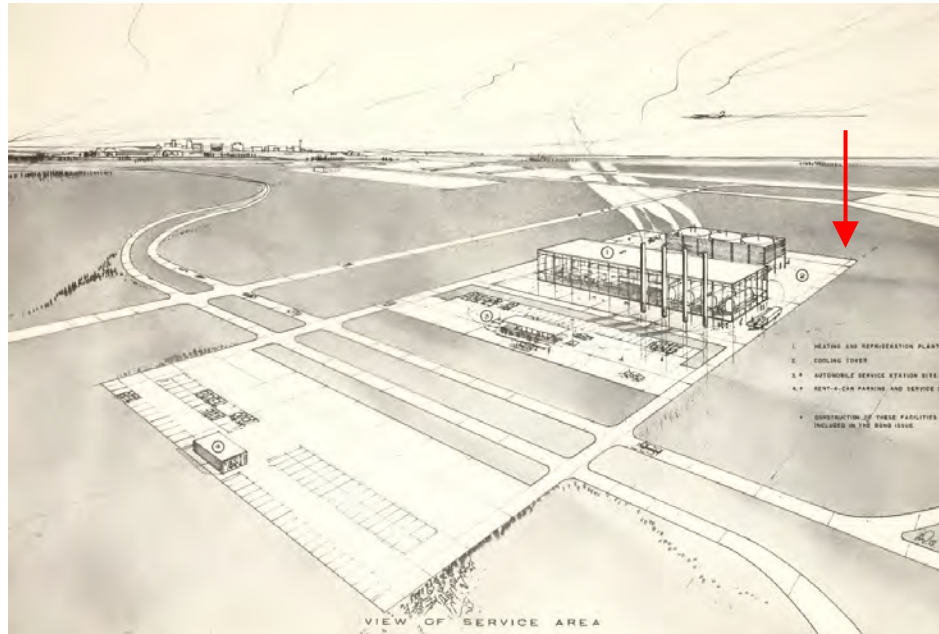
<sup>41</sup> Naess & Murphy, Landrum & Brown, and James P. O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program* (Prepared for the City of Chicago, 1958), Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/chicagohareinte00odon>, Northwestern University Transportation Library.

<sup>42</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 6, 22.

<sup>43</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*.

<sup>44</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 22–23.

Building is mentioned and depicted on an architect's concept of the first stage of development to be located in the service area of the terminal complex.<sup>45</sup>



*Figure 10. Sketch of the Service Area from the 1958 master plan. This document does not mention the O'Hare Telephone Building or any planned building or structure for internal telecommunications. The red arrow indicates as-built location of the O'Hare Telephone Building.*

The O'Hare Telephone Building was independently funded and constructed by Illinois Bell and was located on airport property leased to Illinois Bell. A *Chicago Tribune* article from March 11, 1960, mentions the site of the O'Hare Telephone Building was chosen "with the approval and consultation of Naess & Murphy, the architectural and general contract managing firm for the city in the major O'Hare development program."<sup>46</sup>

The telephone building was not the only building at O'Hare located on land leased from the City and separately funded. The post office building, constructed in 1964, was designed by C.F. Murphy.<sup>47</sup> In an article about the post office, C.F. Murphy was noted as supervising "construction of other buildings at

<sup>45</sup> City of Chicago, Department of Aviation, *Annual Report 1960*, December 31, 1960, 15, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport, Northwestern University Transportation Library, <https://archive.org/details/annualreport1960chic>; James P. O'Donnell, Landrum & Brown, and Naess & Murphy, "O'Hare Field--Chicago International Airport Volume 2. Master Plan Report," November 1960, 46, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/oharefieldchicag02odon/page/n1>, Northwestern University Transportation Library.

<sup>46</sup> Thomis, "Plan 'Dial Anywhere' O'Hare Phone System."

<sup>47</sup> After Sigmund Naess retirement in 1959, the firm of Naess & Murphy was renamed C.F. Murphy in 1960.

O'Hare.”<sup>48</sup> Their input into the location of the O'Hare Telephone Building does not represent a significant association with the firm's master plan for expansion.

**Response to the second SHPO point: The O'Hare Telephone Building does not represent a significant association with Naess & Murphy and cannot be attributed to Stan Gladych; therefore, it does not represent the work of a master.**

The *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* explains how a property would be eligible under *Criterion C* for the work of a master, and when a property would not rise to that level of significance. First, “a master is a figure of generally recognized greatness in a field” and “the property must express a particular phase in the development of the master's career, an aspect of his or her work, or a particular idea or theme in his or her craft.” The bulletin states, “A property is not eligible as the work of a master, however, simply because it was designed by a prominent architect.”<sup>49</sup>

The architectural firm of Naess & Murphy, later known as C.F. Murphy Associates, Murphy/Jahn, and JAHN, represents one of the most prolific architectural firms in postwar Chicago. The works of Naess & Murphy/C.F. Murphy marked a transition in the city from 1930s modernist architecture to the International style of the Second Chicago School of Architecture, which was heavily influenced by the work of Mies. Co-founder Charles F. Murphy, Sr. managed the firm and hired multiple architects and designers for various commissions, including Stan Gladych; Carter Manny, Jr.; Gene Summers; Gertrude Kerbis; and Helmut Jahn. In the 1950s the firm developed a relationship with Mayor Richard Daley, early in his mayoral career. The firm worked on highly visible projects at O'Hare and the Downtown Loop, intended by Daley to promote Chicago as a modern city. Throughout Chicago, Naess & Murphy/C.F. Murphy designed such celebrated works as the Continental Insurance Building, the Central District Water Treatment Plant (now Jardine Water Treatment Plant), the Lakeside Center at McCormick Place, and the Chicago Civic Center (now Richard J. Daley Center).

When compared to the firm's portfolio throughout Chicago and at O'Hare, the O'Hare Telephone Building does not stand out among the firm's body of work or represent a particular phase or aspect of its work. The firm's portfolio includes far more expressively Miesian designs mentioned above in the discussion on Miesian architecture. Compared to these well-recognized design achievements, the O'Hare Telephone Building does not rise to a level of significance that would be a representative example of the work of Naess & Murphy, and in turn considered to be individually eligible under *Criterion C* as the work of a master.

The telephone building cannot be definitively attributed to architect Stan Gladych. The O'Hare Telephone Building, commissioned by Illinois Bell, is recognized as a work of the firm Naess & Murphy. Naess & Murphy selected Gladych as the chief designer for the O'Hare project alongside Carter Manny, Jr. Gladych and Manny worked with a larger team of architects at the firm to complete building designs at the airport. Contemporaneous examples of Naess & Murphy work include Terminals 2 and 3, the Rotunda,

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<sup>48</sup> “Plan Air Mail Post office at O'Hare; Cost 4 Million,” *Chicago Tribune*, February 4, 1964.

<sup>49</sup> National Park Service, *How to Apply the National Register Criteria for Evaluation*, 20.

and the Heating & Refrigeration Plant. The direct role of Gladych in the design of the O'Hare Telephone Building is unknown. Although Gladych was the chief designer, according to first-hand accounts from designers on the O'Hare expansion project, airport buildings designed during this time received substantial input and detailed development by other members of the design team and were not the sole creative work of one person.<sup>50</sup>

Even if the O'Hare Telephone Building could be definitively attributed to Gladych, the building would not qualify as the work of a master. For instance, in the National Register eligibility evaluation of the J. Edgar Hoover FBI Building in Washington D.C. (constructed 1967-1975), a work by C.F. Murphy with Stan Gladych and Carter Manny, Jr. as designers, Gladych was not recognized as a master in the field of architecture. The DOE for the FBI Building notes:

The building's chief designer, Stan Gladych, although well-respected as an architect in his time, is not a figure of generally recognized greatness in the field of Modern architecture, like Mies van der Rohe, Paul Rudolph, Victor Lundy, or Marcel Breuer. Research confirms that Gladych was clearly among the talented architects associated with the so called "Second Chicago School," which refers to the production of work associated with Mies and his followers from 1940s through the 1960s. The historiography gives Gladych scant attention, when, by all accounts, he was the designer of many notable and well-received buildings, including O'Hare, the First National Bank, and the Chicago Filtration Plant. This is likely explained, in part, by the fact that Gladych appears to have only practiced architecture for a year after leaving C.F. Murphy Associates. Gladych essentially dropped out of the field at the age of 50 and lived only ten more years to age 60. This decade during which Gladych was not a practicing architect coincided with the period of time when the legacy of the Second Chicago School was first being established by curators and scholars such as Carl Condit.<sup>51</sup>

The District of Columbia State Historic Preservation Office concurred with the recommendation that the FBI Building is not eligible under *Criterion C* because the building is not a notable example of the work of C.F. Murphy and Stanislaw Z. Gladych, Architects.<sup>52</sup>

In addition, other buildings that Gladych completed at Naess & Murphy, including the Heating & Refrigeration Plant at O'Hare, are more recognized examples of his work. Therefore, the O'Hare Telephone Building, if attributed to architect Stan Gladych, would not represent the work of a master.

**SHPO Comment #6: Example of Central Office design philosophy and represents the property type well.**

SHPO commented in its December 30, 2019, email that "It [Bell] also wanted its buildings to be welcome additions to its surroundings, compatibility, and general economization. This building is an excellent and creative solution to those edicts. For its central offices, Bell wanted buildings that were strong, literally and

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<sup>50</sup> Betty J. Blum, *Oral History of Gertrude Kerbis* (Chicago: Art Institute of Chicago, 1997), 99; Susan F. King, *Interview with Gertrude Kerbis* (Chicago: Art Institute of Chicago, 2007), 19–20.

<sup>51</sup> Quinn Evans Architects, J. Edgar Hoover Federal Bureau of Investigation (FBI) Headquarters Determination of Eligibility Form, September 2013 (Prepared for GSA). Available at [https://www.gsa.gov/cdnstatic/2014\\_05\\_30\\_FBI\\_DC\\_DOE\\_FORM.pdf](https://www.gsa.gov/cdnstatic/2014_05_30_FBI_DC_DOE_FORM.pdf).

<sup>52</sup> David Maloney, DC State Historic Preservation Officer, "Letter to Nancy Witherell, Regional Historic Preservation Officer, U.S. General Services Administration," March 6, 2014.



figuratively, and that portrayed the technology and reliability of the company. This building does exactly that, with its unassailable appearance and clear visual communication of its brawny structure.”

**DOE Information (pages 36, 37, 40, and 46-7):**

Each Bell subsidiary constructed its own Central Office(s) but AT&T, as the parent company within the Bell System, influenced and provided guidance on the design of these buildings nationwide. Having a building that complemented the surrounding area was important for public perception and community relations.

As stated in a 1958 *Bell Telephone Magazine*, “The telephone companies generally hired prominent architects in their community, preferably ones in the same city with the building engineer to permit closer coordination.” However, AT&T typically utilized its corporate consulting architects to review drawings for local projects early in the process to incorporate needed changes and ensure adherence to its corporate vision.

In addition to being constructed throughout cities, Central Offices were also constructed at or near airports out of necessity. These Central Offices supported and sometimes were dedicated to airport facilities. LAX had a Central Office by the late 1950s. Other mid-to-late twentieth century examples of Central Offices serving airports were in Greensboro, Miami, Nashville, and several locations in California, including Irvine, Burbank, and Inglewood. The O'Hare Telephone Building was built as a Central Office devoted to telecommunications at the airport. Prior to the construction of the O'Hare Telephone Building, the airport was included within the neighboring Franklin Park Telephone Exchange.

The form and utilitarian nature of the O'Hare Telephone Building reflects both the function of the building and the unadorned design philosophy that AT&T promoted for Central Office buildings. In form and materials, the O'Hare Telephone Building is like other Central Offices in its rectangular footprint, limited windows for security and climate control, and concrete structural system. The building also has limited ornamentation reflecting economical design and avoiding an appearance of luxury as promoted by AT&T. The interior layout features utilitarian open rooms for equipment. The Garage has a similar form and materials as the telephone building.

The O'Hare Telephone Building was completed in 1961 as a Central Office for the airport's telephone system. By the 1960s Central Offices were a common telephone property type throughout the nation supporting telephone service. In addition, the O'Hare Telephone Building is not unusual in being located on or adjacent to an airport to provide telephone service to an airport, with other examples built at LAX and other U.S. airports. The O'Hare Telephone Building with its stark concrete and brick exterior with few windows reflects a similar simple form and practical design and layout to house equipment that is found in other Central Office buildings across the country. This also reflects the simple design and public perception for the Central Offices that was promoted by AT&T. As a result, the O'Hare Telephone Building was a common property type and is one of many postwar examples that reflected the influence of modernist design principles of the time but with only muted references toward any definitive style lacks design distinction under the National Register evaluation criteria. As such, the O'Hare Telephone Building does not possess significance under *Criterion C* as a distinctive type, period, or method of construction.

**Response: The building is not an important example of a Central Office property type or design.**

Central Office buildings, like the one at O'Hare, served a functional role in housing mechanical equipment for use in telecommunications. Across the nation the Bell Telephone Company aimed to have buildings that displayed good design and complemented their physical context. The company's approach to designing Central Offices is described in two articles in the *Bell Telephone Magazine*: “What It Means To Be America's #1 Builder” featured in the Autumn 1958 issue, and “Better Buildings Make Better Neighbors” featured in the Spring 1961 issue. Bell wanted its buildings, both large and small, to reflect

design excellence, fit within their environment, and avoid the appearance of luxury while conveying the idea that Bell Telephone is a “progressive and forward-looking organization.”<sup>53</sup>

Research into the design and construction of Central Offices nationwide supported the articles about design philosophy and revealed images of contemporaneous buildings. A review of these buildings from the 1960s and 1970s indicates a certain set of design standards were applied nationwide and that it was Bell, not local architectural firms, that drove the building designs in order to achieve a level of consistency across a wide variety of cities, states, and regions.

Bell typically hired “prominent architects in local communities” to enable more efficient coordination between the two parties.<sup>54</sup> As such, it is not surprising that Bell looked to Naess & Murphy to design the O'Hare Telephone Building, as the firm was well established in Chicago and already engaged at O'Hare. As lead designer for the airport, the firm was also familiar with the overall design aesthetic of O'Hare.

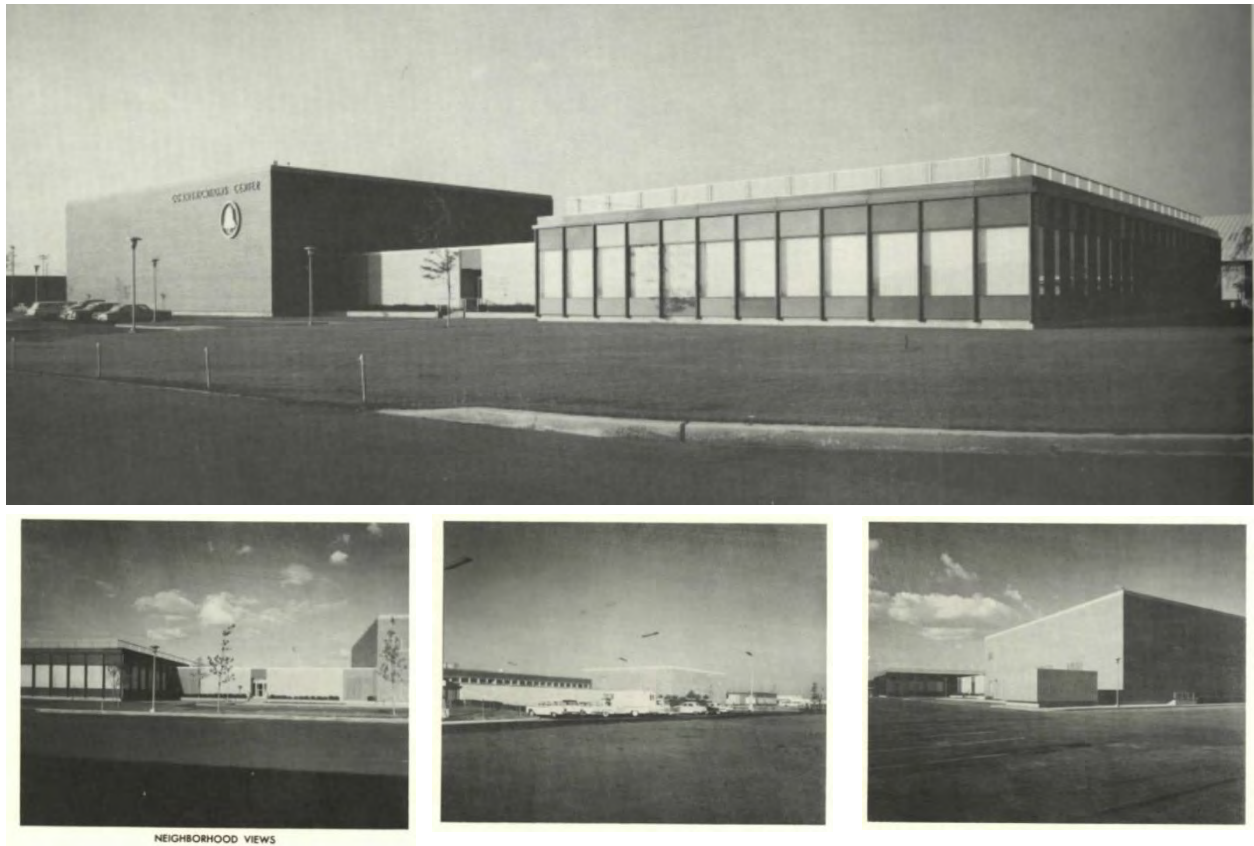
Other Central Office buildings constructed across the nation by the Bell Telephone Company and subsidiaries, including those at other airports, were designed with strikingly similar design characteristics and form as the O'Hare Telephone Building. Shared features include lack of ornamentation, accentuation of building materials, rectilinear or cube form, modular plan, solid brick panels, and exposed structure. For example, the Communications Center at JFK International Airport was constructed in 1962, just after O'Hare, and designed by the prominent architecture firm Voorhees, Walker, Smith, Smith & Haines, which was prolific in Central Office designs throughout the New York region.<sup>55</sup> The building features three main components, with the largest portion serving as the Central Office. It shares similar design characteristics with the O'Hare Telephone Building, such as the cube form, use of glazed brick, exposed structure, lack of fenestration, and flat elevations (see Figure 11). These design characteristics are common among Central Offices around the country, as discussed and illustrated in *Bell Telephone Magazine* articles from 1961 (discussed above, see Figure 12).

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<sup>53</sup> Phillips, “Better Buildings Make Better Neighbors,” 12–13; Howard E. Phillips, “What It Means to Be America’s #1 Builder,” *Bell Telephone Magazine* XXXVII, no. 3 (Autumn 1958): 19.

<sup>54</sup> Phillips, “What It Means to Be America’s #1 Builder,” 19.

<sup>55</sup> New York City Landmarks Preservation Commission, “Long Distance Building of the American Telephone & Telegraph Company,” October 1, 1991, 4, <http://s-media.nyc.gov/agencies/lpc/lp/1748.pdf>.



*Figure 11. Images of the Communications Center at JFK International Airport, constructed 1962, as shown in a 1964 issue of Bell System Noteworthy Architecture. Courtesy of AT&T Archives and History Center.*





*Figure 12. Examples of Bell Central Office buildings constructed by the spring of 1961 throughout the country.<sup>56</sup>*

<sup>56</sup> Phillips, "Better Buildings Make Better Neighbors," 14; Phillips, "What It Means to Be America's #1 Builder," 16–17.

In the Chicago area, Illinois Bell was constructing new Central Offices in the late 1950s and early 1960s, which predominantly exhibited Modern architecture, many of which were designed by the prominent Chicago firm of Holabird and Root. Examples of these Chicago-area Central Offices include the following:

- Lawndale Central Office (1960), 1908 S. St. Louis Avenue, Lawndale, Chicago, Illinois. Designed by prominent architect Holabird and Root (see Figure 13).<sup>57</sup>
- Whiting-Robertsdale Central Office (1961), 1861 Indianapolis Boulevard, Whiting, Indiana. Designed by prominent architect Holabird and Root (see Figure 14).<sup>58</sup>
- Naperville Central Office (1960), 111 W. Franklin Street, Naperville, Illinois (see Figure 15).<sup>59</sup>



*Figure 13. Google Street View image of the Lawndale Central Office (1960) in the Lawndale neighborhood of Chicago, designed by Holabird and Root.*

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<sup>57</sup> "Break Ground for Phone Co. Dial Building."

<sup>58</sup> "Dial Telephones Coming to Whiting Area in 1961," *Chicago Sunday Tribune*, October 11, 1959, sec. 3.

<sup>59</sup> "Begin New Dial Exchange Unit in Naperville," *Chicago Sunday Tribune*, May 10, 1959, sec. 3.





*Figure 14. Google Street View image of the Whiting-Robertson Central Office (1961) in Whiting, Indiana, designed by Holabird and Root.*



*Figure 15. Google Street View image of the Naperville Central Office (1960) in Naperville, Illinois. A two-story addition was added to the original story of this Central Office.*

In 1970 C.F. Murphy designed another Chicago-area Central Office building on Dorchester Avenue near the University of Chicago that was constructed to handle the switching operations for the University and nearby residential community. This building features a very similar design to the O'Hare Telephone Building, exhibiting an exterior defined by concrete gridlines infilled with brick or full-length glazing. This building was shown in a 1971 issue of *Architectural Record*, as one of the "other work[s]" by C. F. Murphy Associates in 1971, following the firm's Lakeside Center at McCormick Place. The text addressing the Dorchester Building is as follows:

A dial central office building located on the south campus of the University of Chicago, this building handles both mechanical and electrical switching equipment for use by the University of Chicago and the surrounding residential community. The building is three stories high, but the structure has been designed to accommodate an additional three stories. The structure is of reinforced concrete on 20-foot bays designed to accommodate the Western Electric switching equipment. The exterior columns are clad with steel as the detail above indicates and the walls are brick infill laid in a Flemish cross

bond crossing. The gross floor area is 69,878 square feet. The total cost of the building was \$2,471,298.<sup>60</sup>

As illustrated in Figure 16 and Figure 17, six of the original glass panels on the Dorchester Building have been infilled with brick. Research did not discover any other Naess & Murphy/C F. Murphy-designed Central Office buildings.

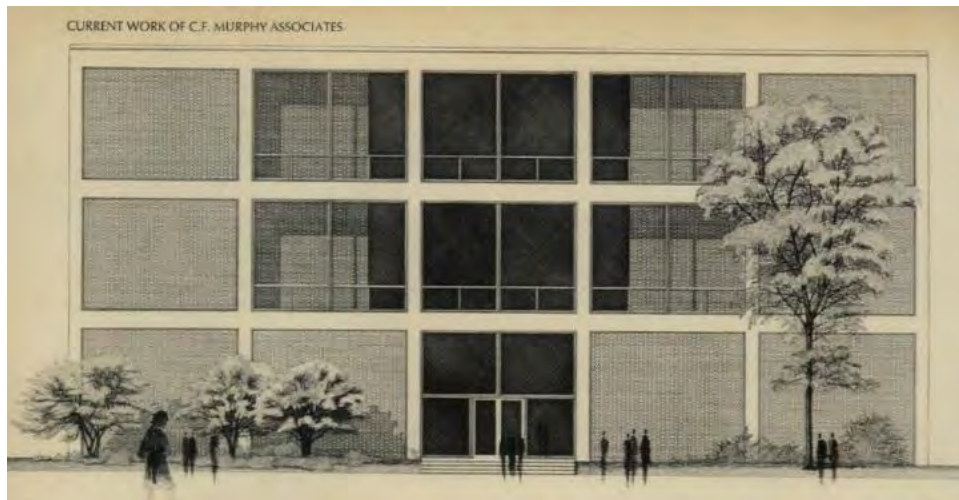


Figure 16. Dorchester Building from the 1971 *Architectural Record* magazine article.



Figure 17. Google Street View image of the Dorchester Building (1970), designed by C.F. Murphy.

<sup>60</sup> "Design in the Miesian Tradition: The Current Work of C.F. Murphy Associates," *Architectural Record* 149 (May 1971): 106.



Central Office buildings constructed during the more contemporary periods continue to exhibit similar modern design features and form to that of the O'Hare Telephone Building. Examples can be found in Birmingham, Alabama; Rancho Mirage, California; and Tucson, Arizona (see Figure 18 through Figure 20).<sup>61</sup> These building designs include cubic forms, brick panels, exposed concrete structure, limited fenestration, and a lack of ornamentation. The construction dates of these examples are unknown but display style and form similar to the example at O'Hare. Therefore, the O'Hare Telephone Building is similar to other central office buildings and not an important example of a central office property type or design.



Figure 18. Central Office in Birmingham, Alabama. Image from [centraloffices.com](http://centraloffices.com)



Figure 19. Central Office in Rancho Mirage, California. Image from [centraloffices.com](http://centraloffices.com).

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<sup>61</sup> "A Tribute to Direct Distance Dialing, the AT&T Long Lines Microwave Network of California and Telephone Central Offices of the Nation," *The Central Office*, 2019, <http://www.thecentraloffice.com/>.



*Figure 20. Central Office in Tucson, Arizona. Image from centraloffices.com.*

### **3. Evaluation as a Potential Historic District**

#### **FAA Recommendation: Support buildings are best addressed as part of a historic district**

Though not suggested by SHPO, further research and discovery of precedent from past FAA Section 106 evaluations led the FAA to reconsider its prior evaluation of the O'Hare Telephone Building as an individual building. Therefore, based on a review of other recent airport documentation and evaluations, the FAA recommends that the subject building is most appropriately evaluated as part of a potential historic district at the airport. An airport's primary function is to provide air travel. This function is supported by a number of main facilities including terminals and air traffic control towers. The telephone building historically served in a supporting telecommunications role at the airport and was one of many support buildings that contributed to the airport's function. A search for prior inventory or evaluations of support buildings conducted by or for the FAA did not uncover any examples of individually considered support buildings. It is common Section 106 practice for support buildings to be evaluated along with the airport's primary buildings as part of a potential historic district. Three recent relevant examples were found through online research and query to the FAA's Federal Preservation Officer. These examples are cited below.

Buildings associated with the Kansas City International Terminal were evaluated for the National Register in 2018 on behalf of the FAA. In a memorandum dated November 15, 2018, addressing the findings under Section 106 for the Kansas City International Terminal Replacement Project, Katherine Andrus, FAA Federal Preservation Officer, stated: "Although the terminal buildings have previously been considered as individual buildings, the interrelationship of the terminals with the airside facilities (runways, taxiways and aprons), groundside circulation features and airport support facilities is best understood within the framework of a historic district." The memo further states:

The boundaries of a potential MCI Historic District would encompass the airfield, the terminals, the Airport Police Station and Central Chilling Plant located in the center of the terminal complex, along with the associated access roads, the earthen dam and drainage control reservoir. These buildings and structures form a significant and cohesive linkage that collectively convey the historic and architectural significance of MCI. This district would also include the other buildings constructed contemporaneously with the terminal complex as well as earlier and later cargo and support facilities, which are linked historically, though not stylistically, to the potential district.<sup>62</sup>

The San Juan Combined/Center Radar Approach Control Facility was also recently evaluated for the National Register. The relationship and use of support buildings is addressed as part of a complex in the Determination of Eligibility Notification for the San Juan Combined/Center Radar Approach Control Facility (dated January 24, 2013), which includes an Administration Building, Mechanical Building, and Operations Building. The FAA and SHPO disagreed on whether the facility was a collection of three buildings or a single unit and SHPO also believed the potential eligibility of the complex was not fully considered. It was the opinion of the Keeper "that the San Juan Combined/Center Radar Approach Control Facility should be considered a single resource based on the functional relationship of the design and use of the property and the interconnected utilities of the complex. This determination is based on National Register guidance that looks at the physical AND functional relationship between buildings." The Keeper's opinion was that the Administration Building was eligible under *Criterion C*. The Keeper did not "believe that the Operations Building or Mechanical Building retain sufficient integrity to reflect the complex's significance under Criterion A, and that the loss of integrity of these two components of the complex renders the entire complex ineligible under Criterion A."<sup>63</sup>

The Ontario International Airport was evaluated for the National Register in 2017. After development of various themes and subthemes, three historic districts and nine individually eligible buildings were recommended eligible. The report notes that "most of the contributing resources to the three historic districts are not individually eligible, as they do not sufficiently represent the themes that they are associated with as individual resources."<sup>64</sup> It is consistent with evaluations at other airports in addressing secondary/support buildings as part of a historic district. The evaluation report further discusses associated property types within each theme. For example, within the theme of civil aviation, 1950-1967 and subtheme of early passenger travel, 1950-1967, associated property types are defined as "historic districts that retain the buildings and structures associated with early passenger travel. Buildings and structures that could be contributing to an eligible historic district might include passenger terminals, baggage claim buildings and conveyance systems, control towers, and office and support buildings. Individual property types with the ability to represent this sub-theme are limited to terminal buildings and control towers, as these property types represent the strongest association with the sub-theme." Support buildings were not seen as having an important enough association alone to represent early passenger travel.<sup>65</sup>

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<sup>62</sup> Katherine Andrus, "Review of Findings under Section 106 for the Kansas City International Airport Terminal Replacement Project - National Register Eligibility of Resources in the Direct APE" (Federal Aviation Administration, November 15, 2018).

<sup>63</sup> National Park Service, "Determination of Eligibility Notification: San Juan Combined/Center Radar Approach Control Facility," January 24, 2013.

<sup>64</sup> ASM Affiliates, *Ontario International Airport Historic Context* (prepared for the City of Ontario, California, September 2017), 55.

<sup>65</sup> ASM Affiliates, *Ontario International Airport Historic Context*, 36, 42.



Based on these precedents, the approach to evaluating O'Hare was revisited and new consideration given to the airport as a potential historic district. Other DOEs prepared for the proposed undertaking (see DOEs for Terminal 2, Terminal 3, Rotunda, Heating & Refrigeration Plant, CDA Control Tower, and Terminal 1 attached) provide the historic context for O'Hare's main period of expansion from 1961 to 1963. During this period, Terminals 2 and 3, the Rotunda, and related support buildings, including the Heating & Refrigeration Plant, were constructed based on the 1958 O'Hare master plan that outlined the overall approach to airport expansion, providing new facilities for passengers and airport staff. A potential district would focus on the airport's terminal core primary buildings during the airport's expansion and represent its mission to provide air travel and satisfy passenger demand and changes within the aviation industry.

The Rotunda and the O'Hare Telephone Building and Garage retain integrity, as described in the DOEs, and therefore would be contributing to a potential historic district. Alterations to Terminals 2 and 3 and the Heating & Refrigeration Plant, also described in the DOEs, are so extensive that even as a portion of the potential historic district, they do not retain enough integrity to convey significance and therefore would be noncontributing.<sup>66</sup> Table 1 summarizes the construction date and function of the buildings constructed during expansion in the early 1960s and addresses if the buildings would contribute to the district's significance. Overall, there would not be enough buildings that contribute within a potential historic district to convey significance and be eligible for the National Register. Additional buildings located near the terminal core reflect later periods of airport development and would not be recommended to be within a potential historic district boundary representing the period of expansion from 1961 to 1963. These buildings, with later dates of construction, are summarized in Table 2. The FAA concludes there is no eligible historic district at O'Hare, and in turn, the O'Hare Telephone Building and Garage is not eligible for listing in the National Register.

**Table 1. O'Hare Terminal Core Properties within a Potential O'Hare Historic District**

Building Name	Historic function	Construction date	Contributing/noncontributing status
Terminal 2	Passenger terminal	1961	Noncontributing due to extensive alterations resulting in lack of integrity
Terminal 3	Passenger terminal	1961	Noncontributing due to extensive alterations resulting in lack of integrity
Rotunda	Restaurant	1963	Contributing
O'Hare Telephone Building and Garage	Telephone building	1961	Contributing
Heating & Refrigeration Plant	Heating and refrigeration building	1962	Noncontributing – due to major expansions and replacement of the front (west) facade, and continuous upgrades, replacements, and relocation of equipment. Results in loss of integrity.

<sup>66</sup> The FAA and SHPO concurred that the Rotunda is eligible. Although Terminals 2 and 3 and the Heating & Refrigeration Plant were found by the FAA to possess significance, they were determined to be not eligible due to a loss of integrity. SHPO concurred with the not eligible finding for these three individual buildings (see SHPO concurrence letters in Appendix C).

**Table 2. Buildings Near O'Hare Terminal Core with Later Dates of Construction**

<b>Building name</b>	<b>Historic function</b>	<b>Construction date</b>
Elevated Parking Building	Parking garage	1973
O'Hare Hilton Hotel	Hotel	1972
CDA Control Tower	Airport control tower	1970
Terminal 1	Passenger terminal	1988
FAA Main Control Tower	Airport control tower	1995

## **Appendix A. O'Hare Telephone Building and Garage Determination of Eligibility**

**See Attachment G-2.8 for the  
complete Telephone Building and  
Garage Determination of  
Eligibility**

**Appendix B. Illinois State Historic Preservation Office  
Correspondence Regarding the O'Hare Telephone  
Building and Garage**





## Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271  
www.dnr.illinois.gov

Mailing Address: 1 Old State Capitol Plaza, Springfield, IL 62701

JB Pritzker, Governor  
Colleen Callahan, Director

FAX (217) 524-7525

Cook County

Chicago

National Register Eligibility, O'Hare Telephone Building and Garage at O'Hare International Airport  
10000 W. O'Hare Ave.  
SHPO Log #011120219

December 18, 2019

Amy Hanson  
U.S. Department of Transportation  
Federal Aviation Administration  
Chicago Airports District Office  
2300 E. Devon Ave., Suite 201  
Des Plaines, IL 60018

Dear Ms. Hanson:

Thank you for requesting comments from our office concerning the possible effects of your project on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

In our opinion, we disagree with your finding and have determined that the O'Hare Telephone Building and Garage are eligible for listing on the National Register of Historic Places.

If you have any questions, please call 217/782-4836.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert F. Appleman".

Robert F. Appleman  
Deputy State Historic  
Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation  
Jamie Rhee, Commissioner, Chicago Department of Aviation

**From:** Hanson, Amy (FAA) <Amy.Hanson@faa.gov>  
**Sent:** Monday, December 30, 2019 3:43 PM  
**To:** Amy Squitieri; Christina Slattery  
**Cc:** dwasiuk@hmmh.com; Kurt M. Hellauer; ORDTAP; Colleen Bosold; Brad Rolf  
**Subject:** FW: FAA response to SHPO notice of disagreement on the Determination of Eligibility for the O'Hare Telephone Building and Garage, Chicago O'Hare International Airport

**Follow Up Flag:** Flag for follow up  
**Flag Status:** Completed

**Categories:** Filed by Newforma

Forwarding:

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration  
847-294-7354

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**From:** Rubano, Anthony <Anthony.Rubano@Illinois.gov>  
**Sent:** Monday, December 30, 2019 3:21 PM  
**To:** Hanson, Amy (FAA) <Amy.Hanson@faa.gov>  
**Cc:** Wallace, Carol <Carol.Wallace@Illinois.gov>  
**Subject:** RE: FAA response to SHPO notice of disagreement on the Determination of Eligibility for the O'Hare Telephone Building and Garage, Chicago O'Hare International Airport

Hi Amy,

Sorry about that. You were clear that you wanted an explanation of why we disagreed on the eligibility of the telephone building and garage, and we intended that our letter include such an explanation, but it just didn't make it in there. We will issue a revised letter that contains the explanation. In the meantime, here's the meat of that forthcoming letter:

This office does not concur with the FAA's determination that the O'Hare Telephone Building and Garage are not eligible for the NRHP.

Page 45 states that the 1960-61 building does not have significance for its association related to technological development or innovation related to telecommunications and in particular to electronic switching because it predates the roll out of electronic switching in 1965, and there is no indication it was designed for electronic switching equipment. It's not proper to say that because a building predates a technological development by 4 years (and that because it did not predict that development), the building is not significant. While it may be true that the building is not significant for electronic switching, that's not the proper technological context to which to compare it. This was the nerve center for airport communications. Just as the control tower is the nerve center for the aviation communication in an airport, this was the nerve center for the ground-based communication. O'Hare would not have been able to function without either. Bell Telephone gave this small building and its equipment a budget of \$4 million or about \$35 million in today's money. It's about 24,000 square feet in size, which means that it cost about \$1,600 per square foot (almost \$14,000 per square foot today). That's an enormous per-square foot cost, and a good indicator of the level of attention and technology

this center was given. It contained the most current and advanced equipment that was available, several banks of which survive inside on the second floor. The March 11, 1960 *Tribune* article "Plan 'Dial Anywhere' O'Hare Phone System" stated: "No other airport in the world will have a system exactly like O'Hare...O'Hare's new net will be like the newest military phone communications network." A 10/5/61 *Tribune* article ("O'Hare to Get Improved New Phone System") states: "That the new center will be an electronic marvel is proven by the service that is planned for the airport and surrounding territory, telephone company officials said. All subscribers, including air lines and concessionaries at the huge field, will be served by a single control office and, thru an electronic relay system, it will be necessary to dial only four numbers for immediate connection to any telephone on the base from any other telephone on the base...The cost for calls from O'Hare to Chicago will drop from 15 to 10 cents each, resulting in a saving to the public and eliminating the need for an operator's assistance in such calls. The new building will not be served by overhead wiring but by lines placed in underground ducts within the airport property." The technology in this building reduced the cost of calls to and from the airport by a third. Clearly the technology was state of the art for 1961, even by military standards, and should not be dismissed because it doesn't represent developments that occurred in 1965.

Page 45 says the building was not outlined in the master plan. But a 3/11/60 *Tribune* article states "The site was chosen with the approval and consultation of Naess and Murphy, the architectural and general contract managing firm for the City in the major O'Hare development program." Page 45 also says that it is not a significant example of the expansion of O'Hare and did not play a significant role in Chicago transportation history. It is not correct. As the sole and dedicated communications center for the airport, it played a critical role in O'Hare's very function. All airline, terminal, gate, and concessionaire communication routed through this facility, as did all calls incoming to and outgoing from the airport. Without this building, there was no communication within the airport or from the airport to the outside world. There are banks of equipment still in place that show current and defunct airlines and terminals.

Page 40 states, "The building also has limited ornamentation reflecting economical design and avoiding an appearance of luxury as promoted by AT&T." The building's lack of overt or applied ornament is exactly in line with the Miesian design philosophy that was used in its design. The exposed concrete structural frame, solid brick infill partitions, modular plan and severe exterior appearance are all characteristics of Miesian architecture. The small lobby and main office are appointed with a well detailed storefront system and full-height glazed partitions, polished terrazzo floor, glazed terra-cotta walls and an ornamental dedicatory plaque. There are no interior public spaces because of the utilitarian nature of the interior functions. But from the exterior and lobby, it is exactly consistent with the overall Miesian design that Naess and Murphy used in the rest of the airport. Secondly, the avoidance of an appearance of luxury was only one of Bell's directives. It also wanted its buildings to be welcome additions to its surroundings, compatibility, and general economization. This building is an excellent and creative solution to those edicts. For its central offices, Bell wanted buildings that were strong, literally and figuratively, and that portrayed the technology and reliability of the company. This building does exactly that, with its unassailable appearance and clear visual communication of its brawny structure. Bell didn't skimp on its architecture, as evidenced by its commissioning Eero Saarinen in 1959 to design its laboratory in Holmdel, NJ. Companies did not hire Saarinen because they wanted an inexpensive, under-designed building. They hired him to provide creative, headline-making works of art, which is exactly what he provided at Holmdel.

Page 46 states that central telephone offices were a common property type. While this is true, this building is not a common iteration for a central telephone office. No other, or very few other, central offices at the time looked like this building. Its lack of ornament is characteristic of its Miesian design. Page 46 says it is "one of many postwar examples that had little to no style or architectural ornamentation." The lack of ornamentation here is stylistic. And it is simply untrue that the building lacks style. Page 47 states that the building does not "appropriately reflect the work of Naess and Murphy in any manner that would represent a significant association with the architectural firm." This is not correct. This building precisely fits into the Miesian aesthetic that the firm embraced since its first Miesian commission, the Jardine Water Filtration Plant, whose design the firm started on in 1953. C.F. Murphy partner Carter Manny, in his oral history at the Art Institute of Chicago, said



that Stan Gladych brought Miesian design to the firm. Gladych designed Jardine, and we know he worked on O'Hare. The firm was fully steeped in Miesian design and the design espoused by the Illinois Institute of Technology by the time it was designing O'Hare and this building. Miesian influences continued at C.F. Murphy long after O'Hare was completed. The firm employed the same Miesian design philosophy for its 1970 AT&T switching station on Dorchester in Chicago. See attached article and:

[https://www.google.com/maps/place/6050+S+Dorchester+Ave,+Chicago,+IL+60637/@41.7845181,-87.5914271,3a,75y,264.19h,98.79t/data=!3m6!1e1!3m4!1sCRxv0cknU6CQy3H2\\_SfGaw!2e0!7i16384!8i8192!4m5!3m4!1s0x880e291a883c7f49:0x55132863657c1e1f!8m2!3d41.7845683!4d-87.5918744](https://www.google.com/maps/place/6050+S+Dorchester+Ave,+Chicago,+IL+60637/@41.7845181,-87.5914271,3a,75y,264.19h,98.79t/data=!3m6!1e1!3m4!1sCRxv0cknU6CQy3H2_SfGaw!2e0!7i16384!8i8192!4m5!3m4!1s0x880e291a883c7f49:0x55132863657c1e1f!8m2!3d41.7845683!4d-87.5918744). Instead of white brick, the firm used brown brick. While the O'Hare building has excellent integrity, Dorchester's integrity is less intact because its central windows were subsequently bricked in.

Page 47 continues that the building and garage have a "simplistic utilitarian design, lack ornamentation, and do not represent a distinctive or fully formed example of any architectural style." This is simply not correct. The straightforward design and lack of ornament, in addition to studied proportions, a pure cubic form, expressed concrete structure, solid brick infill panels, and a flat roof with no expressed parapet, are absolutely representative of a distinctive and fully formed architectural style. They are a direct embodiment of the design philosophies of Ludwig Mies van der Rohe, a design professor at the Illinois Institute of Technology, under whom many Murphy employees studied.

Anthony Rubano  
Deputy State Historic Preservation Officer  
Illinois State Historic Preservation Office  
Illinois Department of Natural Resources  
One Old State Capitol Plaza  
Springfield, Illinois 62701  
(217) 782-7459  
[anthony.rubano@illinois.gov](mailto:anthony.rubano@illinois.gov)

---

**From:** Hanson, Amy (FAA) <[Amy.Hanson@faa.gov](mailto:Amy.Hanson@faa.gov)>  
**Sent:** Thursday, December 19, 2019 3:33 PM  
**To:** Rubano, Anthony <[Anthony.Rubano@illinois.gov](mailto:Anthony.Rubano@illinois.gov)>  
**Cc:** Young, LaDonna <[LaDonna.Young@illinois.gov](mailto:LaDonna.Young@illinois.gov)>; Amy Squitieri <[amy.squitieri@meadhunt.com](mailto:amy.squitieri@meadhunt.com)>; dwasiuk@hmmh.com; Kurt M. Hellauer <[khellauer@hmmh.com](mailto:khellauer@hmmh.com)>; ORDTAP <[ORDTAP@hmmh.com](mailto:ORDTAP@hmmh.com)>; Wells, Patrick J (FAA) <[Patrick.J.Wells@faa.gov](mailto:Patrick.J.Wells@faa.gov)>; Basic, Catherine (FAA) <[Catherine.Basic@faa.gov](mailto:Catherine.Basic@faa.gov)>; Butler, Gail (FAA) <[gail.butler@faa.gov](mailto:gail.butler@faa.gov)>; DeLeon, Jose (FAA) <[Jose.DeLeon@faa.gov](mailto:Jose.DeLeon@faa.gov)>; Terry, Nan L (FAA) <[Nan.L.Terry@faa.gov](mailto:Nan.L.Terry@faa.gov)>; Aaron Frame <[Aaron.Frame@cityofchicago.org](mailto:Aaron.Frame@cityofchicago.org)>; Jamie Rhee <[Jamie.Rhee1@cityofchicago.org](mailto:Jamie.Rhee1@cityofchicago.org)>; Bartell, Deb (FAA) <[deb.bartell@faa.gov](mailto:deb.bartell@faa.gov)>; Christina Slattery <[christina.slattery@meadhunt.com](mailto:christina.slattery@meadhunt.com)>; Colleen Bosold <[Colleen.Bosold@meadhunt.com](mailto:Colleen.Bosold@meadhunt.com)>; Brad Rolf <[Brad.Rolf@meadhunt.com](mailto:Brad.Rolf@meadhunt.com)>  
**Subject:** [External] FAA response to SHPO notice of disagreement on the Determination of Eligibility for the O'Hare Telephone Building and Garage, Chicago O'Hare International Airport

Anthony,

The attached letter is being sent via US mail today, but I am sending you this electronic copy.

Thank you and Happy Holidays.

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration  
847-294-7354

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.





## Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271  
www.dnr.illinois.gov

JB Pritzker, Governor  
Colleen Callahan, Director

FAX (217) 524-7525

Cook County

Chicago

National Register Eligibility, O'Hare Telephone Building and Garage at O'Hare International Airport  
10000 W. O'Hare Ave.  
SHPO Log #011120219

March 16, 2020

Amy Hanson

U.S. Department of Transportation

Federal Aviation Administration

Chicago Airports District Office

2300 E. Devon Ave., Suite 201

Des Plaines, IL 60018

Dear Ms. Hanson:

Thank you for requesting comments from our office concerning the determination of eligibility for the O'Hare Telephone Building and Garage at O'Hare International Airport (SHPO Log #011120219). While this letter does not serve as a formal objection to the Federal Aviation Administration's consultant determination for the O'Hare Telephone Building and Garage, please find our comments below as required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

### Historic Relevance (Criterion A)

Though it predates the roll out of electronic switching in 1965, this building (1960-61) was critical to the operations of O'Hare, as the nerve center for ground-based airport communications. This significance is marked by Bell Telephone's allocation of \$4 million to it, which would equal about \$35 million in today's economy. The cost is a good indicator of the level of attention and technology this center was given. It contained the most current and advanced equipment that was available, several banks of which survive inside on the second floor. The technology was state of the art for 1961, even by military standards. The March 11, 1960 *Chicago Tribune* article "Plan 'Dial Anywhere' O'Hare Phone System" stated: "No other airport in the world will have a system exactly like O'Hare...O'Hare's new net will be like the newest military phone communications network."

An October 5, 1951 *Chicago Tribune* article ("O'Hare to Get Improved New Phone System") states: "That the new center will be an electronic marvel is proven by the service that is planned for the airport and surrounding territory, telephone company officials said. All subscribers, including air lines and

concessionaries at the huge field, will be served by a single control office and, thru an electronic relay system, it will be necessary to dial only four numbers for immediate connection to any telephone on the base from any other telephone on the base...The cost for calls from O'Hare to Chicago will drop from 15 to 10 cents each, resulting in a saving to the public and eliminating the need for an operator's assistance in such calls. The new building will not be served by overhead wiring but by lines placed in underground ducts within the airport property."

As the sole and dedicated communications center for the airport, it played a critical role in O'Hare's very function. All airline, terminal, gate, and concessionaire communication routed through this facility, as did all calls incoming to and outgoing from the airport. Without this building, there was no communication within the airport or from the airport to the outside world. There are banks of equipment still in place that show current and defunct airlines and terminals. Also, as an example of the expansion of O'Hare, it plays a significant role in the transportation history of the City of Chicago.

#### Architectural Relevance (Criterion C)

The building is an excellent example of Modernist architecture, as influenced by Ludwig Mies van der Rohe. Designed by Stan Gladych of the prominent architectural firm C.F. Murphy and Associates, its lack of overt or applied ornament is critical to its architectural design and aesthetic. It has an exposed-concrete structural frame, solid brick infill partitions, modular plan, and severe exterior appearance. The small lobby and main office were built with a detailed storefront system and full-height glazed partitions, polished terrazzo floor, glazed terra-cotta walls, and an ornamental dedicatory plaque. The Miesian design found throughout the airport is reflected in this utilitarian building; the appearance of efficiency and avoidance of applied ornament fit the directive of this type of architecture. This distinctive Miesian aesthetic is representative of C.F. Murphy in general, and Miesian influences continued in the firm's work long after O'Hare was completed.

Please feel free to call 217-782-4836 if you have any questions.

Sincerely,



Robert F. Appleman  
Deputy State Historic  
Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation  
Jamie Rhee, Commissioner, Chicago Department of Aviation

**Appendix C. Illinois State Historic Preservation Office  
Concurrence Letters for the Rotunda, Terminal 2,  
Terminal 3, and the Heating & Refrigeration Plant  
Complex**



## Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271

[www.dnr.illinois.gov](http://www.dnr.illinois.gov)

Mailing Address: 1 Old State Capitol Plaza, Springfield, IL 62701

JB Pritzker, Governor

Colleen Callahan, Director

FAX (217) 524-7525

Cook County

Chicago

National Register Eligibility, Rotunda at O'Hare International Airport

10000 W. O'Hare Ave.

SHPO Log #016120219

December 18, 2019

Amy Hanson

U.S. Department of Transportation

Federal Aviation Administration

Chicago Airports District Office

2300 E. Devon Ave., Suite 201

Des Plaines, IL 60018

Dear Ms. Hanson:

Thank you for requesting comments from our office concerning the possible effects of your project on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

We concur with your finding that the Rotunda at O'Hare International Airport is eligible for listing on the National Register of Historic Places.

If you have any questions, please call 217/782-4836.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert F. Appleman".

Robert F. Appleman

Deputy State Historic

Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation

Jamie Rhee, Commissioner, Chicago Department of Aviation



## Illinois Department of Natural Resources

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JB Pritzker, Governor

Colleen Callahan, Director

FAX (217) 524-7525

Cook County

Chicago

National Register Eligibility, Terminal 2 and Concourses E & F at O'Hare International Airport

10000 W. O'Hare Ave.

SHPO Log #014120219

December 18, 2019

Amy Hanson

U.S. Department of Transportation

Federal Aviation Administration

Chicago Airports District Office

2300 E. Devon Ave., Suite 201

Des Plaines, IL 60018

Dear Ms. Hanson:

We have reviewed the information you have provided concerning the referenced project.

We concur with our finding that these structures lack sufficient significance for listing on the National Register of Historic Places.

This letter does not constitute a State Historic Preservation "Sign-off" on the project for the purposes of Section 106 of the National Historic Preservation Act of 1966, as amended.

If you have any further questions, please call 217/782-4836.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert F. Appleman".

Robert F. Appleman

Deputy State Historic

Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation

Jamie Rhee, Commissioner, Chicago Department of Aviation





## Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271

[www.dnr.illinois.gov](http://www.dnr.illinois.gov)

Mailing Address: 1 Old State Capitol Plaza, Springfield, IL 62701

JB Pritzker, Governor

Colleen Callahan, Director

FAX (217) 524-7525

Cook County

Chicago

National Register Eligibility, Terminal 3 and Concourses H, K and L at O'Hare International Airport

10000 W. O'Hare Ave.

SHPO Log #015120219

December 18, 2019

Amy Hanson

U.S. Department of Transportation

Federal Aviation Administration

Chicago Airports District Office

2300 E. Devon Ave., Suite 201

Des Plaines, IL 60018

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Robert F. Appleman

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Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation

Jamie Rhee, Commissioner, Chicago Department of Aviation



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JB Pritzker, Governor

Colleen Callahan, Director

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Cook County

Chicago

National Register Eligibility, Heating & Refrigeration Plant Complex at O'Hare International Airport

10000 W. O'Hare Ave.

SHPO Log #013120219

December 18, 2019

Amy Hanson

U.S. Department of Transportation

Federal Aviation Administration

Chicago Airports District Office

2300 E. Devon Ave., Suite 201

Des Plaines, IL 60018

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